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VOL. II.—9TH YEAR.

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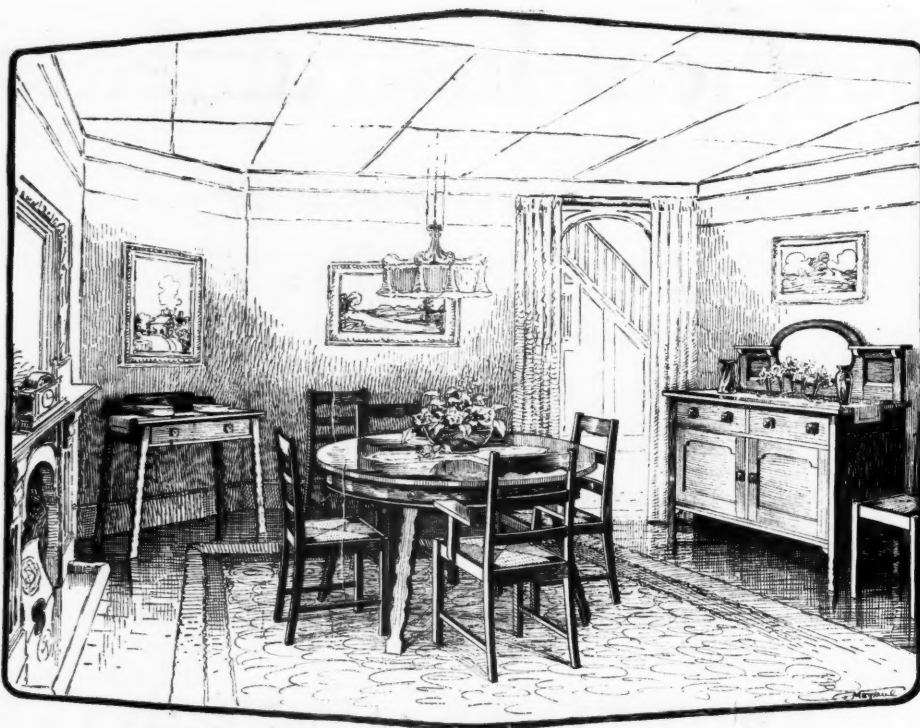
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INDUSTRIAL HYGIENE AND THE MEDICAL PROFESSION¹

BY A. J. LANZA, M.D.,

*Advisory Expert in Industrial Hygiene, Department of
Health of the Commonwealth.*

It is not perhaps generally realized that industrial hygiene has in recent years progressed so rapidly that it will in this respect compare favourably with any other branch of preventive medicine. It has produced a most voluminous literature, is the subject of a number of admirable text-books and its development has been accompanied by the enactment of numerous laws and regulations governing industry. Nevertheless, it is only now beginning to be appreciated and it is still the subject of misconception and indifference by both the medical profession and the general public. This is probably because the influences that have brought industrial hygiene to its present proficiency, both as a science and as an art, have been largely removed from the usual sphere of the medical practitioner.

The history of the development of industrial hygiene in the past quarter century is beyond the scope of our discussion. Suffice it to say that the underlying cause, the *vis a tergo*, was and is economic pressure, the ever-increasing demand for

the conservation of, not only financial resources, but human lives. To Great Britain belongs the credit for most of the pioneer work in this field; then came the great war, which, with its re-vamping of all the British industries, made of industrial hygiene a live and vital thing and produced the celebrated Health of Munition Workers Committee, with the consequent activities that are evidenced to this day by the researches and publications which emanate from the Home Office.

In the United States of America the enactment of compensation laws of a comprehensive and far-reaching character compelled the larger employers to set their house in order. This gave a tremendous stimulus to the art of industrial hygiene, which was gradually followed by an appreciation on the part of the manufacturer that it was good business for all concerned to introduce hygienic practices into industry, with the result that in a great many cases he soon left the requirements of the law far behind.

The Hazards of Industries.

It goes without saying that the development of modern industry has profoundly affected the mode of life of the entire community, particularly the industrial worker. It is inevitable that among all the reactions resulting from modern conditions there should be those unfavourable to the human organism. The specific poisons and hazards of in-

¹ Read at a meeting of the New South Wales Branch of the British Medical Association on July 28, 1922.

dustry continue to produce their quota of disease and disability, although they are being more and more successfully dealt with. There are, however, less obvious hazards of industrial employment—crowding, indoor work—and the sum of those conditions that make up the physical environment of the worker, namely, the temperature, humidity, movement and purity of the air, illumination, posture, the nature of the work itself. Any one or number of these, when unfavourable, produce an undue amount of wear and tear on the human organism and lessen the normal resistance to disease. Furthermore, we have the important influences of age and sex.

Without going into detail as to the modes of action of these various influences, which are based on known physiological rules, it is next in order to consider to what extent these industrial conditions operate to produce disease, disability and death. What evidence have we as to the ill-effects of working conditions among the industrial population? And the answer is that we have little direct evidence that will link together any specified occupation or any particular condition of work with any definite clinical condition, excepting, of course, where specific hazards are found. In this latter field there have been spectacular demonstrations which, by their very brilliance, serve to make difficult and to obscure the search for information along allied, but less clearly defined, lines of activity. I refer particularly to such investigations as those of miners' phthisis in South Africa and the remarkably complete and thorough investigation recently completed in Broken Hill and some of the researches in lead poisoning, phosphorus, etc.. When we turn to those industries—and they are in the majority—in which the hazards to health lie in the deviations from acceptable standards of hygiene, we begin to grope. We have to rely on large masses of evidence of a more or less indirect nature.

We know that the amount of time lost through illness among industrial workers is enormous. On an average, it amounts to from seven to nine days per worker per year. This figure is true for the United States of America and, as far as can be ascertained, for Great Britain; our investigations here tend to confirm it for Australia. There is a wide variance in different groups of workers, but "across the board," so to speak, the figure holds good. It gains in impressiveness when we realize that the amount of time lost through illness is about four times as great as the time lost through accident. The bulk of the illness comes within the classification of the preventable diseases.

Statistics relative to friendly societies compiled by the Commonwealth Statistician for the year 1918, which may be taken as an average year, give an average membership of 476,187 who drew sick pay for 535,270 weeks, averaging 6.7 days per year per member. This is really not a total figure, as the statistics do not include the illness causing disability for one- or two-day periods. Applying the figure 6.7 to the total working population, we get a lost-time sickness figure amounting to 10,050,000 working days or 32,108 working years. In order to get a comparison with conditions previous to

the war, we ascertained from the same source that the average for 1911 was 7.9 days per worker per year.

Comparative mortality tables compiled by the Registrar-General's Department, Great Britain, for 1910-1912 are illuminating (I quote from the recently published work of Collis and Greenwood). Taking the clergy as a basis and marking their comparative mortality rate at the arbitrary unit of 100 we have for industrial workers the following:

| | |
|---|-----|
| Agricultural labourers (very little difference) | 106 |
| Bricklayers | 149 |
| Coal miners | 164 |
| Saddlers | 166 |
| Printers | 174 |
| Cabinet makers | 179 |
| Tailors | 180 |
| Commercial clerks | 181 |
| Cotton manufacturers | 183 |
| Shoe makers | 188 |

All these industries are comparatively free from specific hazards.

It may be asked that, granted these figures as to the extent of illness among industrial workers are correct, how shall we determine or approximate what amount of the whole is due to the conditions of employment and what to conditions outside of employment in the home and elsewhere.

It is, of course, hardly ever possible in the light of our present knowledge to separate with any clear-cut margin the respective influences of these two sets of conditions. When we attain to the status of carefully collected and interpreted morbidity and mortality statistics, we shall be in a position to arrive at a clearer conception of the matter. Morbidity statistics, as applied to occupation, are an unexplored and undeveloped field. When, furthermore, we consider the vast total of illness, note the variance in various trades and particularly that the better paid occupations are by no means the lowest in sickness experience, we are forced to conclude that occupation must exert a powerful influence. Mr. Rusher, of the Royal Statistical Society, has recently published a most valuable and brilliant article on the statistics of industrial morbidity in Great Britain, in which he concludes: (1) That age has the greatest influence upon the rate of sickness. Next to this, occupation is the most important factor in determining the amount of sickness. (2) Occupation has more influence upon the rate of sickness than either locality or density of population. (3) While locality and density have probably a minor effect upon the sickness rates, this effect cannot generally be disassociated from that due to occupation.

The Industrial Employment of Women.

The mortality from tuberculosis also furnishes a most interesting side-light on occupation. It is not possible to make more than a passing reference to the subject here; but one or two facts are worthy of comment. Greenwood and Tebb, in a special report to the Medical Research Council, point out that employees in unhygienic munition factories suffered from tuberculosis to a greater extent than similar employees in similar factories where the hygienic conditions were good. There is very little evidence available to show the effects of industrial

employment upon women, a subject of the greatest importance to Australia, with its ever-increasing manufacture of textiles and woollens. The experience in Great Britain indicates (I again quote from Collis and Greenwood) that the entry of women into industry during 1914-1915-1916 was followed by a marked rise in the female tuberculosis mortality in each age group, most marked in the younger groups, and that this rise declined as they came out of industry, without, however, falling back to the 1913 mark, except for older women. They conclude that no cause can be ascertained for this rise in tuberculosis mortality, except the industrialization of the women.

It is evident from all of this that there is an overwhelming need in Australia for adequate information as to the nature and extent of the effects of employment, especially upon women and adolescents, and for the application of the resources of medical science to industry.

The Industrial Hygienist.

We need the aid of medical science in the examination and certification of adolescents before and during employment. Physical examinations of children and those employed in certain designated dangerous trades should be made by appointed certifying surgeons. By restricting this duty to regularly appointed physicians rather than anyone who may be convenient, there will soon be formed a body of experienced physicians acquainted with the nature of the occupation concerned. We need the aid of medical science for the recognition of occupational poisonings. Efforts are constantly being made to improve working conditions; laws and regulations are framed from time to time regulating ventilation, illumination and similar matters, but nowhere does the hand of the medical man appear and yet the whole matter resolves itself into an appreciation of the construction and the needs of the human machine. The problems of adequate factory inspection, the recognition of health hazards, the formulation of hygienic standards, the reporting of occupational poisonings, the safeguarding of women and children in industry, all represent practical problems that we cannot begin to solve until we effect a more intimate contact between medical science and industry and bridge the gap that at present separates them. Until this is done, many of the well-intentioned efforts now being put forth will fail of their purpose. There should be made available to those departments supervising factory inspection the services of designated physicians to act as medical inspectors of factories. In the present light of our knowledge and the advancement of medical science, it is absurd to allow the detection of health hazards, specific or general, in industrial plants to depend on the observations of persons entirely free from medical training.

There is a need then on the one hand of men with a regular medical training to specialize and devote either part or whole time to duties connected with the official governmental supervision of factories and workshops. The responsibility for bringing this about rests, partly at least, with medical men, that is to say, with the medical societies. Until they recognize and call attention to this need and

thus help to overcome it, we will continue to have supervision and regulation of human health which is not founded on an adequate knowledge of the human organism.

On the other hand there must be a more ample recognition on the part of the medical profession as a whole of the influence of occupation on morbidity and mortality. The general occupation and specific job are items of information that belong, with family history and the history of previous illness, in the clinical record. Many of the problems that beset us at present relative to certain types of work, the influence of piece-work, the influence of age and sex, await alike the experience and evidence of the general practitioner as well as the special investigator.

The medical officers of the metropolitan hospitals, where numerous industrial workers are treated for disease and accident, are in a position to make a substantial contribution to the whole subject of industrial morbidity. Here also a recognition of the possibilities in this regard by the attending physicians and the hospital staff is all that is requisite to release this information. As far as I am aware, hospital records are not being utilized in this manner.

There is a growing tendency in Australia for the larger employers, especially those who employ many women, to introduce trained nurses into their establishments to advise and supervise their employees. It is a most admirable tendency and one that is uniformly successful, as the employers themselves most readily testify. But if these trained nurses are to accomplish the best possible results, both in utilizing to the utmost the advantages of their training and at the same time avoiding responsibilities for which they are not fitted, they must in turn be supervised by physicians. I realize that not many industries can afford to secure the whole-time services of a physician or, to put it more correctly, are not yet educated to that point; but where the establishment is large enough to necessitate the services of a nurse, it can afford the services of a physician for a sufficient number of hours, daily or weekly, to see that the nurse is doing her duties in an intelligent manner, is not overstepping her bounds and, most important, is keeping records of what she does for compilation at regular intervals.

In the United States of America the development of industrial hygiene has been along the lines of introducing the physician into the industrial plant, supervising the sanitation of the plant, rendering surgical relief in case of accidents and a degree of medical relief varying with the location of the plant, its size and nature of work. In the matter of factory regulation and inspection they have not yet reached the high standard prevalent in Great Britain. On the other hand, where the industrial physician has had a chance to exercise his skill, some remarkable results have been achieved. When all is said and done, the greatest opportunity will come to the physician who becomes directly associated with an industrial plant. By studying the conditions of work, rectifying errors of hygiene, promptly treating injuries, recognizing remediable defects in employees, conserving the health and strength of

substandard individuals, he can effectually lessen lost time and promote good feeling as well as efficiency. Most valuable service will be rendered by the compilation of illnesses causing absence and classifying them by department, occupation and age groups, especially when a number of industrial physicians can institute this type of information, based on first-hand knowledge and experience. The medical director of a large concern in the United States of America employing several thousand men and women, has been able to reduce the lost time per employee per year from the average nine days *per annum* to 11.5 hours *per annum*, a remarkable accomplishment in preventive medicine. There is in the United States an Association of Industrial Physicians and Surgeons, with about a thousand members and the membership constantly increasing, with State and local branches who meet annually; and several universities provide special post-graduate training in the various branches of industrial hygiene and medicine.

In Australia the tendency to bring the physician and the nurse into the factory is a most valuable forward step and a most hopeful sign for the future. At the same time we should not lose sight of the fact that there should be a compensating progress along allied lines of medical interest, namely, the improvement of the factory inspection, the formulation of minimum hygienic standards, the establishment of systems of morbidity reports and research into the effects of employment. With progress along these lines, as well as by bringing the physician into the industrial environment, we will be reasonably sure that the vast bulk of illness among industrial workers will be appreciably reduced and preventive medicine gain new and lasting laurels.

SILICOSIS, MINERS' PHTHISIS AND MEDICAL INSPECTION.

By J. S. PURDY, M.D.,

Metropolitan Medical Officer of Health, Sydney.

DR. E. L. COLLIS, Professor of Preventive Medicine of the Welsh National School of Medicine, late Medical Inspector of Factories, England, in the Milroy Lectures, 1915, dealt with the subject of industrial pneumoconioses, with special reference to dust phthisis or pulmonary silicosis.

The conclusion, after an exhaustive study with reference to no less than one hundred and three contributions, is that, whilst dust inhalation plays an important part in determining the occurrence of respiratory diseases, some dusts, such as coal, not only appear to have no power of producing pneumoconioses, but even may possess some inhibitory influence on phthisis, other dusts, such as limestone and plaster of Paris, are devoid of all action, but most dusts have an injurious influence and of all dusts that of silica is the most injurious.

During the past four years there has been in the Transvaal a Miners' Phthisis Medical Bureau under the chairmanship of Dr. W. Watkins Pitchford, with a staff of first and second medical examiners, a

medical radiographer, eight medical examiners, one pathologist, one secretary and eleven clerks. The expenses are a charge against the Consolidated Revenue Fund of the South African Union.

As showing how exhaustive have been the investigations carried on at the Bureau under the chairmanship of Dr. W. Watkins Pitchford, the fact that 42,030 clinical examinations and investigations have been made and that during the last year 29,062 radiographic negatives were prepared is evidence.

The legal object of the examinations is the detection, certification and compulsory removal from underground work of those who become tuberculous, whether or not the tuberculosis is complicated by silicosis.

In 1919 an ante-primary stage of silicosis was recognized legally, being interpreted by the earliest detectable specific, physical signs of the disease. Among 15,468 working miners, 562 cases of silicosis in the ante-primary stage were discovered, making the prevalence of this condition at the rate of 3.633 per thousand; 384 (68.3%) of the sufferers had accepted compensation and retired by the end of the year, while 178 (31.6%) remained as "working miners."

The number of new cases of "pure" silicosis in the primary or secondary stage which were found to have originated amongst 14,664 "working miners," all of whom had been previously examined by the Bureau, was 398. All the 398 cases were in the primary state, no secondary stage cases having originated *de novo*.

It is interesting to note that Collis agrees that silica mixed with other dusts is less harmful than pure silica and points out that in the industries in which a rock containing 98% of silica is used for the manufacture of high-grade bricks, there is a mortality from tuberculous silicosis of 37%, while in industries using a mixture of silica and clay the corresponding mortality does not rise above 1%. He suggests that pure silica is readily combined in colloidal compounds, which, by poisoning the cells, render them more vulnerable to Koch's bacillus. The presence of organic acids in clay dust appears, on the other hand, to prevent the formation of these colloids, at any rate before the silica particles have been swept away by phagocytosis.

It will be remembered that the Broken Hill Commission recently found that the pneumoconiosis of lead miners is characterized by a fibrous peribronchial proliferation, different from the silicosis of quartz miners, and that the chemical analysis of the lungs revealed the presence of lead, manganese and silica. The Commission classified the lung condition into three categories: (a) Fibrosis, first stage. (b) Fibrosis, second stage. (c) Fibrosis with tuberculosis.

The Commission observed tuberculosis in 35% of all the cases of pneumoconiosis. Among the workers who had been drilling less than ten years in the mines, 2% were found to have pneumoconiosis and 0.4% tuberculosis. Amongst those who had been drilling more than twenty years in the mines, 11% were found with pneumoconiosis, 0.7% with

advanced pneumoconiosis and 6.4% with tuberculosis. Amongst the workers who had been drilling thirty years or more in the mine, 38% were found to have pneumoconiosis, classified as follows: 11% first degree fibrosis, 5% second degree fibrosis and 22% fibrosis with tuberculosis. A certain number of men also showed symptoms of lead poisoning.

The Commission of Inquiry concluded that all workers who are found to have either simple or complicated fibrosis, should be immediately withdrawn from work underground and that in the future the miners should all undergo X-ray examination. Any radiographic anomaly should be followed up by a complete medical examination. They further recommended that a laboratory should be furnished for research in pneumoconiosis and expressed the opinion that preliminary and periodical examinations of all the miners and removal from the mines of all men affected with pneumoconiosis would insure complete security for the future health of the personnel in this industry.

I understand there is still some objection to the introduction of medical examination of miners at Broken Hill and I still retain vivid recollection of the objection raised thereto at Waihi, New Zealand, in 1909, at the time I was investigating pneumoconiosis in quartz miners in the Dominion and the then Premier, Sir Joseph Ward, introduced this disease into the schedule under the *Employers' Liability Act*, which, owing to a threatened strike of miners, when medical examination was insisted on by the mine owners, was struck out.

Recently I took advantage of the visit of Dr. Charles Porter, Medical Officer of Health, Johannesburg (who had furnished me twelve years ago with a preliminary copy of the first report of the Transvaal Miners' Phthisis Commission, extracts of which I published in 1911, on "Pneumoconiosis in Quartz Miners: Its Cause, Incidence and Prevention") to gain information with regard to the results following the introduction of medical inspection of miners in the Transvaal.

On his return to South Africa, Dr. Porter interviewed Dr. W. Watkins Pitchford, Chairman of the Miners' Phthisis Medical Bureau, who has forwarded me the following brief statement and has permitted me to make any use thereof I may consider desirable. This statement with regard to the position in the Transvaal should prove of some interest as regards Broken Hill at the present time:

Since the passing of the *Miners' Phthisis Act* of 1916, no case of miners' phthisis or silicosis, as it is officially known in the Union, has originated in any man (whether previously a miner or not), who has been passed as fit for underground work at the initial examination of the Bureau. During the five and three-quarter years comprising this period, 8,356 European men have received certificates of fitness to follow mining work and 4,222 of these are known to have obtained underground employment. As the total number of European miners is about 14,000 and the average number in actual underground employment in scheduled mines during the year is only ten or eleven thousand, it is evident that a substantial proportion of the latter are men who hold the certificate of initial fitness.

All the cases of silicosis, whether complicated or not by tuberculosis, which have originated amongst our miners since 1916 have, then, been in "old miners," i.e., men who, being in employment prior to 1916, were not required to pass the initial medical examination.

It is not contended that this relative freedom from silicosis of those who have been recruited since 1916 is entirely due to the exclusion of physically unsuitable men by the initial examination, for the continuous improvement in underground conditions of work, which has been going on since about the year 1911, must now be bearing fruit. Managements and men are at present so unanimous in their efforts to carry out the dust-prevention regulations that the air of the workings is now often found to be more free from dust than the air of the streets of Johannesburg.

The prevention of dust, however, would not, by itself, suffice to prevent the spread of disease, especially tuberculosis, amongst the miners. Our law requires every miner to be medically examined at least once in six months, in order to detect those who have developed tuberculosis. This enables the Medical Bureau to secure the prompt removal of every person who is tuberculous and thus to protect the other miners from infection. A man who has developed silicosis, is always confidentially notified of the fact and he may give up his work or not, just as it pleases him; but if he develops tuberculosis, whether or not he also has silicosis, he is obliged to give up his occupation at once. The rates (per 100,000 miners examined) at which cases of silicosis complicated by tuberculosis have originated each year since 1917 have been 860, 852, 163 and 124. Such figures indicate a most gratifying reduction.

Pulmonary tuberculosis, without silicosis, is now considerably less common among our miners than it is amongst the male population of the industrial towns of England and Wales.

No case of silicosis in the secondary stage has originated amongst our employed miners since the year 1919.

The consolidating and amending Act of 1919 introduced a new stage of silicosis, which was to be legally recognized, viz., that stage in which the physical signs of the disease first appear in their earliest detectable form. This stage was termed the "ante-primary" stage, because it refers to a condition antecedent to that previously known to all the miners as the "primary" stage. Its recognition obviously requires, not only that the miner should be examined by an expert, but also that the expert shall be able to refer to carefully kept records of previous examinations. In the first year in which the existence of this new stage was legally allowed for, 562 cases were certified and in the second year 219 cases, all of them in both years being, as already stated, in "old miners."

It is agreed by all impartial observers that the work of the Medical Bureau is indispensable to continued progress. The value of its initial examinations has now become obvious to all and the service which it renders the individual worker, by keeping him periodically informed as to his health with respect to pulmonary diseases, is greatly appreciated by the miners themselves.

It is necessary to point out, however, that the work of the Medical Bureau would not have been so successful were it not for the following conditions: The members of the Bureau devote their whole time to the work and are not allowed to engage in private practice; the Bureau is appointed and controlled solely by the Government—neither the employers nor the workers have any power of interference with its duties; and the examinations of the Bureau are always supported by standardized X-ray negatives of high technical quality.

One is surprised to hear a rumour that there is opposition on the part of the workers in Australia to the principle of systematic medical supervision of the health of the miners. As far as the Witwatersrand is concerned, it is safe to say that any proposal to abolish such supervision would be strenuously opposed by the workers.

SUPERACUTE PULMONARY ŒDEMA.

By A. R. SOUTHWOOD, M.D.,
Adelaide.

Introduction.

IN October, 1919, I reported in THE MEDICAL JOURNAL OF AUSTRALIA two fatal cases of superacute Œdema of the lungs. Several other medical men have described in succeeding numbers of the journal cases occurring in their practice. A case complicating labour, reported by Dr. Sydney Verco, was particularly interesting.

It was a curious coincidence that a similar outburst of enthusiasm on this subject found vent in the columns of *The Lancet* and *The British Medical Journal* in October, 1919, and the following months. The name of "acute suffocative catarrh" was adopted by most of the English writers. The condition, however, is not an inflammatory one and the name of superacute pulmonary Œdema better describes it and is in keeping with its pathology.

On investigating the literature, I found that in 1907 a similar discussion on pulmonary Œdema originated from the description of a case in *The Lancet* by Dr. Leonard Williams. Dr. Williams deplored the absence of adequate mention of the condition in the English text-books; the French books, however, gave it an important place.

I have since collected histories of three further cases and these are now reported. They fully illustrate the statement made in a recent article in THE MEDICAL JOURNAL OF AUSTRALIA that "no condition is so sudden and unexpected in its onset or so fraught with immediate danger to the patient in whom it manifests itself, as acute pulmonary Œdema." Moreover, it "must always be regarded as an accident that is liable to be met at any time in medical practice, an accident in the event of which the practitioner must be prepared to act immediately and without hesitation."

Clinical Reports.

CASE NO. 1.—Mr. T.M., miner, forty-six years of age, was admitted to hospital at 10 p.m. on April 8, 1920. He was sitting propped up and looked anxious and extremely ill. He was quite conscious. His face was pale and was covered with beads of cold sweat. The breathing was distressed and "wet"—the bubbling noise was audible outside the ward; the rate was forty to the minute. There was no expectoration. The temperature was 36° C. The pulse was regular and full, 144 to the minute; the systolic pressure was 240 millimetres, the diastolic 180 millimetres. The cardiac impulse was in the sixth intercostal space in the anterior axillary line.

The condition was evidently one of acute Œdema of the lungs, complicating arterio-sclerosis and probably chronic interstitial nephritis.

Hypodermic injection of atropine 0.0012 gramme (one-fiftieth of a grain) gave no relief. I then performed venesection and he felt easier as soon as the blood began to flow, 0.85 litre (thirty-three ounces) was withdrawn and the respirations quietened almost to normal. The systolic blood pressure just after the bleeding was 170 millimetres, diastolic 125 millimetres. He was comfortable and settled down to sleep.

The next morning I elicited the following history: While walking home from work, a distance of about a mile, on

April 7, the day before admission, he experienced a sudden choking sensation, accompanied by wheezing on the chest and profuse perspiration. He called on a chemist, who prescribed a powder; in ten minutes the distress was relieved. He dined and slept well that night. On April 8 he worked as usual and felt well. During the walk home the choking feeling again came on; it was worse than on the previous evening. The chemist was not at his shop and without a powder the patient continued homewards. In spite of the distressed breathing he ate a good dinner. Rattling in the chest soon ensued and rapidly increased. A doctor was called in and he ordered immediate removal to hospital.

The severe symptoms, therefore, had risen with dramatic suddenness. Apart from occasional "bilious attacks," the man had been in good health. These attacks of headache and retching had been recurring about once a month for two years, the last being four days before admission. His eyesight had been failing for two months. For twenty-five years he had worked underground at Broken Hill and twenty years ago he was ill for ten months with lead poisoning.

On April 9 only a few moist sounds could be heard at the posterior aspect of the bases of the lungs. He passed 2.4 litres (eighty ounces) of urine in twenty-four hours; its specific gravity was 1.008; it was acid and contained a heavy cloud of albumin (0.1%); its urea content was 1.4%; it contained no sugar. I was working on the subject of acidosis in chronic nephritis at this time and I found the alkali reserve in the blood extremely reduced (Sellards's method); the tolerance to bicarbonate test confirmed this—it required eighty-five grammes of sodium bicarbonate, taken in five-gramme doses every two hours, to make the urine alkaline.

Ophthalmoscopic examination showed no abnormality.

On April 13 he had a severe convulsive seizure; this was relieved at once by the inhalation of amyl nitrite. During the next few weeks he had several similar fits. On one occasion the cerebro-spinal fluid was found to contain 0.2% of urea. He also had numerous attacks of distressed breathing, but there was no recurrence of the general pulmonary Œdema. Death occurred from uræmia in June, 1920.

CASE NO. 2.—Mr. S.L., labourer, aged forty-two years, came under my care in January, 1921. His again was a condition of chronic interstitial nephritis. He had suffered from headaches and giddiness for seven years. He had worked underground at Broken Hill for fifteen years, but left there five years ago. During 1920 his health failed rapidly; the headaches became worse, attacks of abdominal pain and vomiting occurred once or twice a month and his eyesight became poorer. He passed large amounts of pale urine, especially at night. There was marked arterio-sclerosis; the peripheral arteries were thickened and tortuous, the heart was enlarged, the blood pressure was very high—systolic, 270 millimetres; diastolic, 180 millimetres.

For a few weeks he was well enough to get up daily and to stroll about. On the evening of March 1 he felt a tightness in his breathing; he went to bed, but orthopnoea persisted; he spat up a large amount of clear froth, not blood-stained; the application of mustard poultices to the chest relieved him. I was not called to him in this attack. Next morning he was fairly well, but in the evening he again had distressed breathing and he sat up all night.

On March 3 he was walking about. In the midst of his evening meal, however, he had to leave the table on account of feeling weak and giddy. Respiration became very distressed; he described the sensation as choking. I saw him at 8 p.m. He was then propped on his hands and knees on the bed, in an agonizing struggle for breath. He could not lie down, so severe was the distress. The respirations were very noisy and "wet," the rate was forty-four to the minute. He was expectorating large amounts of salmon-pink froth; the chamber was almost half filled. He was conscious and realized his dangerous state.

I thought the inhalation of amyl nitrite would give some ease, but two capsules of 0.3 cubic centimetre (five minims) appeared only to increase the distress. Hypodermic injection of nitro-glycerin (0.0012 gramme, i.e., one-fiftieth of

a grain) proved useless. His condition was certainly desperate. I decided to venesect. Speedy improvement followed the operation. After losing about a litre of blood the patient was able to lie down in comfort and his breathing was much slower (twenty-eight per minute), quiet and easy. The change was truly amazing.

There were several subsequent dyspnoea attacks, but none was so severe as that just described. On March 24 there was a second definite attack, though a mild one, of general pulmonary oedema. The breathing was distressed and "wet," moist râles were audible all over the whole chest and there was slight blood-stained expectoration. The dyspnoea was far less severe than in the first attack and he was able to remain recumbent. An injection of nitro-glycerin relieved.

In order to estimate the extent to which the kidneys were damaged, I determined the urea concentration in the blood on March 16; it worked out at seventy milligrammes of urea-nitrogen per one hundred cubic centimetres of blood. Although the diet was kept low, especially in protein, by April 15 the urea-nitrogen concentration had risen to one hundred and four milligrammes. The twenty-four-hour urine amounted to 1,400 cubic centimetres, containing 11.2 grammes of urea and 0.42 grammes of ammonia. There was, therefore, ample evidence of extreme renal deficiency.

The heart failed rapidly after the oedema attacks and for the greater part of the time the patient had to remain in sitting posture in bed. Moist sounds were never absent from the bases of the lungs and oedema of the legs, scrotum and penis supervened. Cardiac dilatation increased; the apex beat was in the fifth space, one centimetre outside the mammary line, in January; in the sixth space, nearly three centimetres outside, in March; and in the seventh space, in the anterior axillary line, in April. There was an apical systolic bruit and the second sound at the pulmonary area was accentuated. The systolic blood pressure varied from 195 millimetres to 165 millimetres and the diastolic from 135 millimetres to 120 millimetres.

Dyspnoea, anasarca and flatulence became increasingly troublesome and death from cardiac failure occurred at the end of May.

CASE NO. 3.—Mrs. A.R., an obese lady of sixty-two years, consulted me in May, 1921, on account of dyspnoea, pain across the præcordium and flatulence. A few moist sounds were audible at the pulmonary bases. The cardiac impulse was displaced just beyond the mammary line; no bruit was detected, but the sounds were rather indistinct. The pulse rate was 120; the systolic blood pressure was 170 millimetres of mercury and the diastolic blood pressure was 110 millimetres. The specific gravity of the urine was 1.020; it contained much albumin and a little sugar. On my telling her of the glycosuria, she said it had been first detected twelve years previously, when she was for ten weeks in the Adelaide Hospital with a severe attack of pneumonia. Until that time she had enjoyed good health, but for five years after she was troubled with a cough and with occasional "heart turns." Latterly she had been well, except for slight shortness of breath on exertion. I ordered her to bed for a week and reduced her diet, especially the carbohydrate, but also the total intake. The glycosuria rapidly cleared and the albumin decreased. At the end of June there was neither sugar nor albumin in the urine; a few moist sounds were still present at the bases of the lungs; the pulse rate was reduced to ninety-six; the systolic blood pressure was 210 millimetres and the diastolic 115 millimetres.

I regarded her condition as one of arterio-sclerosis and mild diabetes, the oedema at the bases of the lungs and the albuminuria being evidence of a failing heart. The high specific gravity of the urine (even when sugar-free), the rapid clearing of the albuminuria on resting and the absence of general oedema together indicated that the cardiac rather than the renal apparatus was primarily at fault. I prescribed a mixture containing potassium iodide and digitalis.

On July 18 she complained of a feeling of weakness in the right arm and leg; the pulse rate was 120, the systolic blood pressure was 230 millimetres and the diastolic 120

millimetres. Although there was no actual paralysis, it appeared certain that a slight cerebral hæmorrhage had occurred. I stopped the administration of digitalis and ordered a mixture containing nitro-glycerin. I had to meet the usual difficulty in cases of this nature—to steer the patient between the Scylla of cardiac failure and the Charybdis of cerebral hæmorrhage.

I was called urgently to her at 3 a.m. on July 27. Half an hour before she had awakened with severe dyspnoea and this rapidly became worse. She was sitting supported in bed, cyanosed and covered with cold sweat. The breathing was rapid, noisy and "wet" and a small amount of dull red froth was being expectorated. She made efforts to speak, but they only resulted in unintelligible gibberish. She was desperately ill and I decided to venesect without delay. The blood was dark and it flowed very slowly at first. Gradually the dyspnoea eased and, as it did so, the blood flowed more freely. Improvement was not rapid, however, so I gave an injection of 0.0024 gramme (one-twenty-fifth of a grain) of atropine during the bleeding. The amount of blood withdrawn was 0.7 litre. When I left her at 4.30 a.m. the breathing was easy; there was a soft whistling, but none of the "wet," bubbling sound. Her colour had improved. The pulse rate was 100; her systolic blood pressure was 105 millimetres and her diastolic blood pressure was 68 millimetres.

At 9.30 a.m. the pulse rate was 120; the force was variable, the systolic pressure ranging from 150 millimetres to 160 millimetres, the diastolic from 95 millimetres to 105 millimetres. The respiration was still somewhat gasping. There was motor aphasia and right hemi-paresis. At 1 p.m. the respiration was easy.

Three days later the aphasia had completely cleared, the face muscles had regained their normal state and the arm and leg had improved. The urine contained much albumin, but no sugar. The urea-nitrogen concentration in the blood was twenty-three milligrammes per one hundred cubic centimetres of blood, indicating only a slight renal deficiency. The systolic blood pressure was 185 millimetres and the diastolic 100 millimetres; the pulse rate was 96. Moist sounds were still present at the base of each lung. The general condition of the patient was good and she was soon able to get up in a wheel chair.

For a month she remained fairly well. On August 25 the systolic blood pressure had risen to 200 millimetres and the diastolic to 120 millimetres; the pulse rate was 100. At 3.30 a.m. on August 29 I was called to see her in the second attack of pulmonary oedema. This was less severe than the first and I hoped to avoid bleeding. I gave an injection of morphine, 0.015 gramme (one-quarter of a grain), atropine, 0.0024 gramme (one-twenty-fifth of a grain); and strychnine, 0.002 gramme (one-thirtieth of a grain). There was no improvement within half an hour. I venesected and relief was rapid. She was soon comfortable. The urine then contained a moderate amount of albumin, slight acetone, no sugar. The blood showed urea-nitrogen concentration of thirty-five milligrammes per one hundred cubic centimetres and glucose concentration of two hundred and fifty milligrammes per one hundred cubic centimetres. This was somewhat surprising in view of there being no glycosuria at the time. The renal deficiency had increased and that probably accounted for the marked hyperglycæmia without glycosuria.

During the night of January 7, 1922, a further attack of acute oedema occurred. No relief was obtained from an injection of morphine and atropine, nor from amyl nitrite inhalations. Venesection to the amount of five hundred cubic centimetres was followed by rapid improvement.

On January 24 the blood pressure was: systolic, 170 millimetres; diastolic, 100 millimetres. The specific gravity of the urine was 1.020; it contained neither albumin nor sugar.

Early in May a subacute attack of bronchitis occurred. Although this soon subsided, moist râles have remained audible at each pulmonary base. The systolic blood pressure has reached 210 millimetres and the diastolic 120 millimetres. The patient is able to move about the house with the aid of a stick; the hemi-paresis is greatly improved.

An interesting feature of this case was the simultaneous

occurrence of cerebral hæmorrhage with the attack of acute œdema.

Treatment.

The treatment of an attack of superacute pulmonary œdema may be summed up in the one word—venesection. Most authorities are agreed that this simple measure is *par excellence* the treatment, giving uniformly the best results. It is surprising that it was not made use of in the case recently recorded by Dr. Frederick G. Corbin.

Hirschfelder says that pulmonary œdema is the signal for venesection in any except the most anæmic.

Huchard, quoted by Leonard Williams, says: "*L'asphyxie est rapide. Pas une minute n'est à perdre. Il faut pratiquer la saignée. . . . La saignée doit être large; 300 à 400 grammes. Le médecin n'hésitera pas. Sans crainte de la syncope et malgré l'aspect blafard du malade, il tirera la quantité de sang nécessaire.*"

The immediate cause of these very acute attacks of œdema is the rapid failure of the left side of the heart. The circulation of the blood in both the pulmonary and systemic beds becomes retarded in a degree proportionate to the rapidity of cardiac failure. It is obvious that in such a condition of circulatory stasis any drug, administered orally, subcutaneously or even intravenously, would have the greatest difficulty in entering the systemic capillary bed. In severe cases venesection is a mechanical one—to provide immediate relief to an overtaxed right side of the heart. Venesection would appear to be the only sur-

In the less severe cases drugs are of value; the cardiac tonics and vaso-dilators—the action of the latter being essentially identical with that of removing a small amount of blood—are commonly used. If these fail, venesection should be performed.

Leonard Williams sums up wholeheartedly in favour of venesection: "Having regard to the fact that acute œdema of the lungs is an accident which may befall a patient at any time, even in our consulting rooms, it is well for us to be prepared with a means of treatment which is so well and positively recommended."

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RADIOGRAPHY OF THE APPENDIX.

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THE value of radiographic examination in the diagnosis of appendiceal disease is but little known to the general practitioner and surprise is frequently expressed at the demonstration of the barium-filled appendix in skiagrams taken in the course of an ordinary opaque meal examination.

A valuable opinion may be given on the state of the appendix in practically every case examined and the appendix shadow itself can be demonstrated in over 80% of examinations.

Before proceeding to opaque meal examination of patients in whom disease of the appendix is suspected, it is as well to make an examination of the urinary tracts. For this purpose a preliminary purgative is given, preferably castor oil, but an ordinary soap and water enema would be suitable. Saline aperients should be avoided, as they usually leave troublesome gas accumulations in the colon and these lead to confusion and possible error in interpretation.

After the examination of the urinary tract has been completed, the patient is given a meal consisting of barium sulphate suspended in mucilage of acacia; a cooked cereal meal, for some reason, is unsuitable for the demonstration of the appendix.

The meal is prepared by mixing one hundred grammes of barium sulphate with fifty grammes of powdered gum acacia and cold water is added to make a smooth paste. Then warm water is stirred in until a bulk of four hundred to five hundred cubic centimetres is reached; sugar and vanilla may be added to taste. The patient drinks the meal slowly.

The stomach and duodenum are examined as a routine and the patient is again seen after six and twenty-four hours.

Gastric delay is frequently seen with a large six-hour residue, when no pyloric stenosis is present, but when there is some obstruction in the terminal ileum, care must be taken not to diagnose pyloric stenosis due to organic disease of the stomach.

Gastric hypersecretion also is frequently found in cases of chronic appendicitis.

After twenty-four hours the patient is seen and examined in the recumbent and Trendelenburg positions and the abdomen may be gently palpated under the fluorescent screen, while skiagrams may be taken at any stage. In taking skiagrams of the right iliac fossa, exposures need not be so short as in gastric work, but certainly better definition is obtained by rapid exposures.

When the appendix shadow has been made out on the screen, the diaphragm shutters are closed somewhat and the following points noted in regard to the organ: its size, shape, position and the degree of fixation or mobility.

Palpation is carried out gently and an effort is made to determine whether any tenderness complained of is present in all positions of the patient, whether standing, recumbent or in the Trendelenburg position. The caecum and appendix may vary

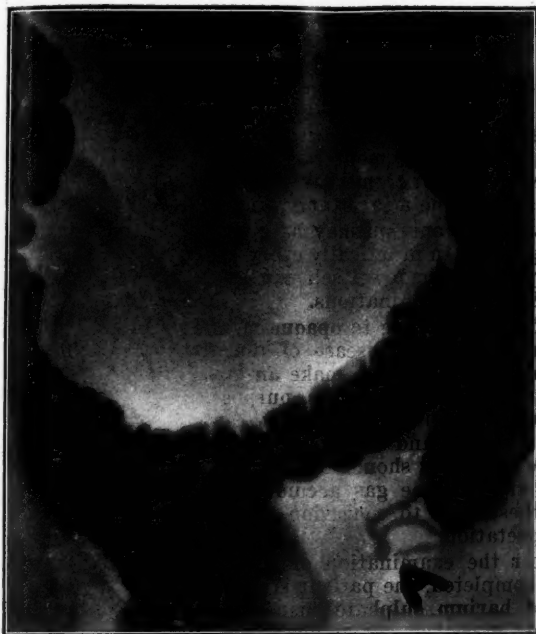


FIGURE I.
Long Kinked Appendix (A) Fixed at Tip.



FIGURE II.
Large Appendix (A) with Lane's Kink of Terminal Ileum (I).

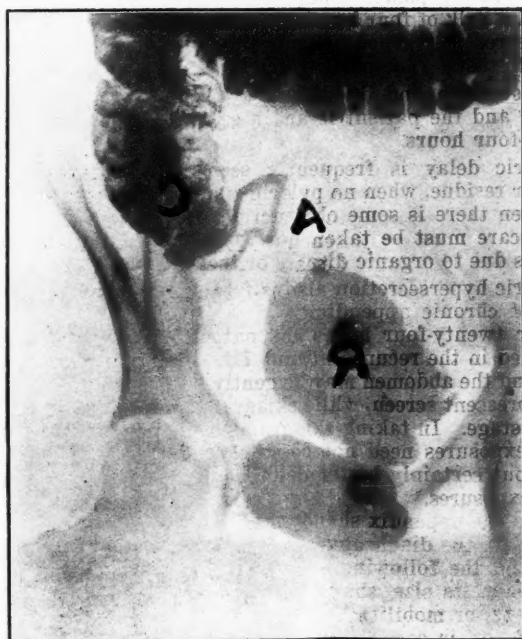


FIGURE III.
Central Appendix (A) Fixed. C = Caecum, R = Rectum.



FIGURE IV.
Large Fixed Appendix (A).

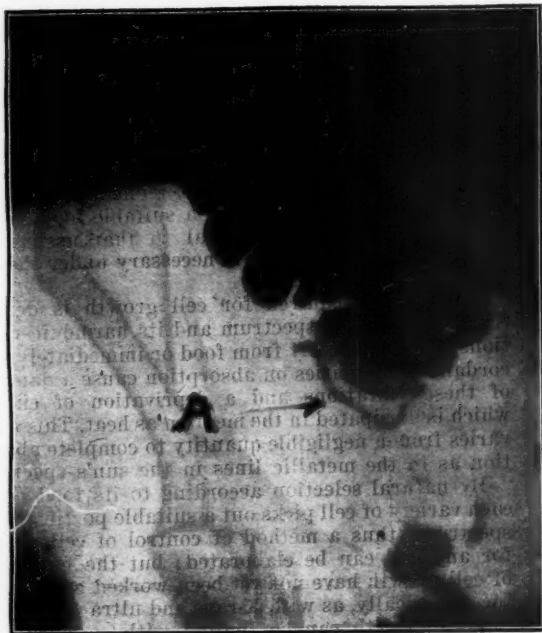


FIGURE V.
Extra-Caecal Appendix (A). Skiagram taken with the patient rotated to the left.

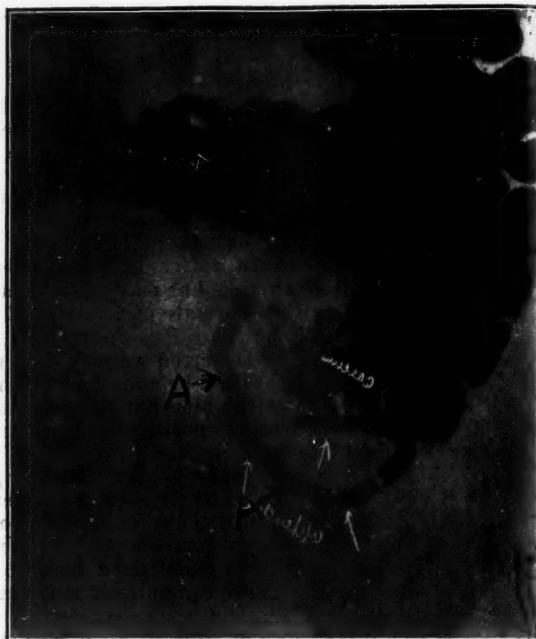


FIGURE VI.
Enormous Appendix (A A).

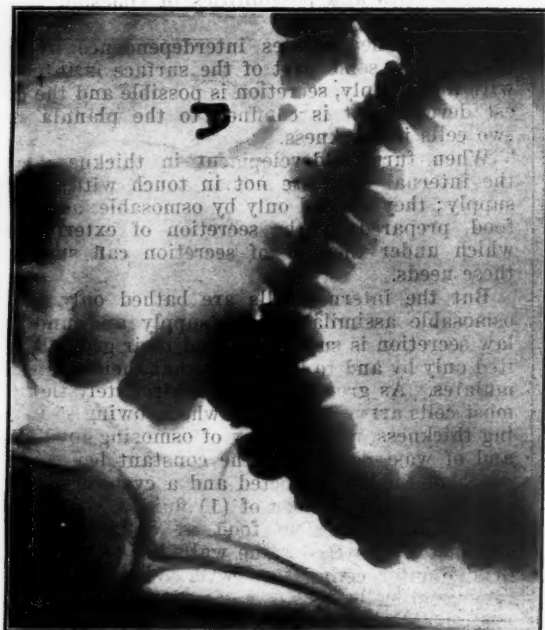


FIGURE VII.
Thick Appendix (A) Showing Segmentation.

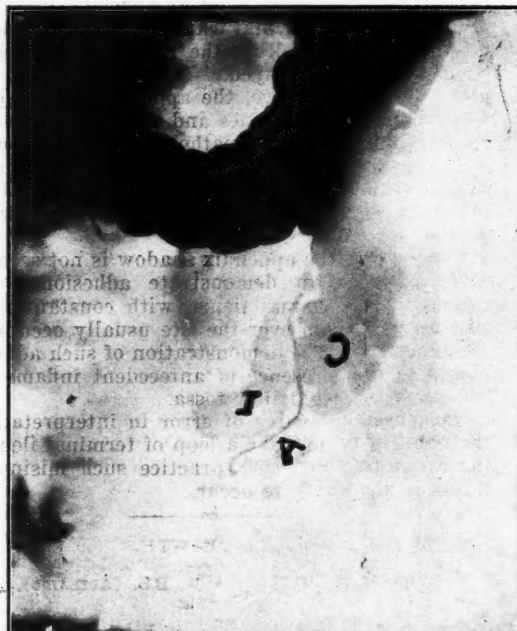


FIGURE VIII.
Long Appendix (A) Adherent along its Length to Terminal Ileum (I).

in level by as much as ten centimetres (four inches) in these various positions and, of course, the tenderness should move with movement of the organs.

The size of the lumen of the normal appendix is small and its outline regular and it should not contain barium after the caecum has emptied; its length, of course, varies greatly.

The pathological appendix may have a lumen of great size, even as large as a centimetre in diameter, while the shadow may show segmentation, due, possibly, to the presence of faecal collections.

The larger appendices are frequently associated with delay in the terminal ileum, with or without the presence of adhesions. It might be noted here that such adhesions need not cause actual obstruction by mechanical kinking, but may cause delay by interfering with the normal peristalsis of the intestine.

By palpation under the screen we may determine whether the appendix is fixed by adhesions or kinked and any attempts to straighten out this kink or to move the appendix from its position will cause pain and discomfort.

The appendix may be found in many unusual positions. In four patients recently seen the appendix was situated to the left of the mid-line, in another it was adherent to the pylorus and in yet another the caecum and appendix were fixed beneath the liver. All these cases were examples of malrotation of the caecum.

In many instances the appendix can be demonstrated lying in a central position and adherent at its tip, while the caecum is in its normal position. In such circumstances, when the caecum becomes loaded, there is a dragging on the appendix, with consequent appendicular colic.

A retrocaecal appendix or an appendix lying laterally to the caecum may cause difficulty in demonstration, but by rolling the patient to the left, it can usually be displayed.

As mentioned above, the appendix should empty when the caecum empties and any marked delay in emptying points to a pathological condition.

If the appendix cannot be visualized at the first examination, the patient should be seen at hourly intervals and in the majority of cases it will be seen at one of the screenings.

Even where the appendix shadow is not seen, it is often possible to demonstrate adhesions of the caecum and terminal ileum, with constant tenderness on palpation over the site usually occupied by the appendix. The demonstration of such adhesions points to the presence of antecedent inflammatory lesions in the right iliac fossa.

One possible source of error in interpretation is the liability to mistake a loop of terminal ileum for the appendix, but with practice such misinterpretation is not likely to occur.

CELL GROWTH.

By W. M. SINCLAIR, M.B., B.S. (ADELAIDE),
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INVESTIGATIONS concerning the normal and essential functions in the nutrition of the unicellular organism and their effects on the organism show

that assimilation is inversely proportional to waste of the cell or excretion up to a certain point above which death of the cell occurs and this point may be known as the sublethal constant.

(i.) Growth is directly proportional to the assimilable food supply.

(ii.) Growth is inversely proportional therefore to the waste of the cell or the excretion up to the constant.

(iii.) Growth under these conditions is absolutely dependent on secretion, which alone produces the assimilable food supply from a suitable food supply and is inversely proportional to that assimilable food supply, which latter is necessary under the law of conservation of energy.

The energy required for cell growth is derived from the invisible spectrum and its harmonic variations, either remotely from food or immediately. Discordant periodicities on absorption cause a damping of these vibrations and a deprivation of energy, which is dissipated in the medium as heat. This effect varies from a negligible quantity to complete absorption as in the metallic lines in the sun's spectrum.

By natural selection according to its food needs, each variety of cell picks out a suitable portion of the spectrum; thus a method of control of cell growth for any cell can be elaborated; but the harmonics of cell growth have not yet been worked out, excepting empirically, as with X-rays and ultra-violet light.

Thus growth can be limited with every and all cells and unlimited growth only possible under these laws.

Cellular behaviour under natural conditions can thus be postulated and, accepting evolution of multicellular organisms from the unicellular type, the penalties and possibilities of cohesion of cells can be deduced.

Cohesion necessitates interdependence in nutrition; whilst some part of the surface is in contact with food supply, secretion is possible and the greatest development is confined to the planula stage, two cells in thickness.

When further development in thickness occurs the internal cells are not in touch with the food supply; they are fed only by osmosable, assimilable food, prepared by the secretion of exterior cells, which under the law of secretion can supply all these needs.

But the internal cells are bathed only by this osmosable assimilable food supply and under the law secretion is suppressed and their growth is limited only by and to the extent that their waste accumulates. As growth proceeds, ultimately the innermost cells arrive at a stage where, owing to increasing thickness, the difficulty of osmosing food supply and of waste results in the constant being passed, death of the cells affected and a cyst results. The contents of cyst consist of (1) fluid waste in excess, (2) fluid assimilable food at a minimum, (3) the dead cell bodies. The walls of the cyst consist of (1) outer cells intact with every function, (2) innermost cells on the verge of death, (3) intermediate cells of diminishing vitality from without inwards and with secretion suppressed.

Any further increase in cells capable of growth under the law will result in a further death of

innermost cells and an increase in the size of the cyst. As the cyst increases in size and in weight, assimilable food supply being lessened and waste increasing beyond the constant, rupture takes place in the part of the cyst in contact with the earth and environmental influences will cause collapse of the cyst, the expulsion of its contents more or less and the admission of food supply from the primæval slimes. The innermost cells will at last be under the similar conditions to the external cells, but with a lessened circulation through the stoma by osmosis or by current and under the law of secretion increase of the cyst wall to almost double its former thickness will now be possible until the constant being passed for the interior cells, a cœlome is formed. This is the primary cœlome, following the gastrula stage as above and this cœlome in all higher types is entirely obliterated, being represented in the metazoa only by the subcutaneous and submucous potential spaces. Within this cœlome the whole of the mesodermic tissues is developed by various mutations and ultimately completely fills it as described above. The segmental cœlomic cavities are a later development. The lining of the primary cœlome will be ectodermal cells on the exterior continuous with the entodermal cells through the stoma, where a transition takes place owing to the different conditions from circulation through the stoma and their previous limitations.

The entoderm will be somewhat thinner and of lessened vitality from living nearer the constant than the ectodermal. Both will be lined by a layer of cells where the nutrition and vitality will be at a minimum and this is the precursor of the basement membrane, which in any case can be taken to prove the original direction from which the nutrition of the primary cells came and is always on the side farthest from the source of food.

Further development can only occur by a mutation taking place in the cells of this primary basement membrane.

A mutation is due to the capacity of any cell for assimilating food material of a more complex or simpler molecular structure. It is a fundamental quality of protoplasm, deprived by natural laws of secretion in the presence of a possible molecular arrangement of the food supply and is always associated with a change in form of the mutating cell, which latter is under difficulties with regard to its normal nutrition.

These conditions are all fulfilled by the cells of this primary basement membrane, a possible food supply of a more complex nature being present in the dead bodies of the cells breaking down to form the primary cœlomic cavity.

And the first mutation occurring, as it must have occurred for further development to be possible, it would take place where conditions were at an optimum and the mutating cell would escape for a time the penalties under the law of excretion and would multiply until the constant were again passed under these new conditions, when degeneration would repeat itself. A secondary cœlome would be formed, intestinal or digestive, and body segments would develop according to the number of mutations.

Elimination of final waste is achieved in the

simpler forms of metazoa by stoma formation for each body segment.

Later as the vascular system became developed under the same laws from joining up of smaller spaces formed as above, more complicated forms of excretory organs were developed in order: (1) stoma, (2) nephrostomes, (3) nephridia, (4) the ordinary kidney. And so for the various organs. The most profound change in nutrition occurred on emergence from the primæval slimes, when movement was sufficiently developed through the amphibians permanently *ad terram firmam* in the ectoderm, which then had to subsist entirely by reversed nutrition, osmosing through the basement membrane.

The secretion from the external cells ceased, owing to conditions being reversed and their being bathed only in assimilable food supply elaborated by the cells of the entoderm, which then formed the sustenance group under the law.

Exposure to drying and atrophy of cells passing the constant under accumulated excretion resulted in keratinization of outer cells and gradual exfoliation. The nutrition of these unmutated cells is probably of the simplest type, a provision by Nature to give originally these cells the widest range, survival of this simple type being more probable through natural selection.

It seems probable that under the law of conservation of energy the energy requirements of cells under similar conditions being about the same, the waste of the first mutating cells would be more complex and a possible and easier source of energy to the cells of the primary basement membrane and a cell using this waste would mutate more easily and become a true symbiote to the cell whose waste it used.

If it were possible to measure the average energy requirements of the mutating cells and also the energy derived from the steps of cleavage of the dead protoplasmic molecule, it would be possible to state how many such symbiotic mutations were possible, up to the point where no more energy was available to cell processes. But the elucidation of this is impossible and unnecessary; all that is necessary is the efficient removal of waste by some means, many such being evident in a study of forms from the lowest to the highest in Nature.

Is it possible from these data to give a rational explanation of the behaviour of the cancer cell?

In the first instance, the ectodermal cells, as the simpler type, which are under reversed nutrition owing to removal from their original environment, may be taken. Normally the nutrition of these cells will consist of the simplest osmosable end products of the mesodermic metabolism; under early conditions of life this is sufficient and effective. As life proceeds and as a result of reactions in the nutritive fluid media or blood of the mesoderm to unicellular organisms gaining admission to the media or of their products, secretion, excretion or assimilable food supply, there accumulates in the blood certain materials foreign to the fixed metabolism of the multicellular organism; if there be incapability of excretion by the organism under the law in this closed system, death of the invading organism will result and its accumulated excretion will act as a protec-

tion whilst present to any further invasion by the latter. In other words, an active immunity has been established, which is specific for this organism. This material is incapable of conversion for excretion except by the cells of the fibrous tissue forming group, that is, the white corpuscles of various natures and the lymphatic gland system, which dispose of this material in one of two ways: (1) by conversion to simpler substances through use as food in the variable assimilatory powers of this group, either originally variable or capable of easy mutation, probably the latter; (2) by absorption of the residue if relatively non-toxic and laying down and conversion of the whole cell and residue into fibrous tissue or if toxic, death and liquefaction of cell with the formation of abscess.

In favourable cases this process results in a complete clearance of the foreign material, but in others, in spite of it or as a result of it, various residues accumulate and in the course of life sooner or later under the law exhaustion of the fibrous tissue group commences. This occurs in one of two ways: (a) Fibrous tissue is laid down in excess throughout the system, as in old age, with especial accumulations in or near the excretory organs, kidneys, lungs, digestive system or skin. (b) Or locally as a sign of incomplete general reaction and under some local lesion of ectoderm, a focus of chronic irritation develops.

In either case at some point there develops a local limitation of assimilable food supply from either (i.) difficulty in osmosis through increased fibrous tissue resulting from (2) above, especially liable in exposed parts, under local injury, exposure to actinic sun's rays, etc., for example, biotriple, or (ii.) a large accumulation of bacterial products and round cell reaction as in (b).

Sooner or later under the law of secretion in an abundant food supply secretion is established in some of the cells of the depleted area and under the law of growth rapid multiplication of these cells occurs, which at first is more or less controlled in the case of biotriple by their own excretion, until from central breaking down of cells of the nodule passing the constant, a communication with the exterior results in elimination of controlling waste and rapid growth of these secretory cells at the expense of the mutated mesodermic cells by active digestion and progressive enlargement of the ulcer ensues.

If the exhaustion of the fibrous tissue group is only complete locally, there will be little interference with nutrition of the fixed mesodermic cells. A leucocytic response to the products of the ulcer reaction entering the general circulation will occur and wasting generally will not be marked; secondary manifestations will be delayed and resort to the knife in removal of the primary focus may avert catastrophe, while fibrosis in the tumour will be marked. But if the fixed tissues are markedly wasted by interference with their nutrition by these products of exhaustion of fibrous tissue group, secondary manifestations are inevitable because local fibrosis is at a minimum, the active secretory cells can readily enter the lymph system; an abundant supply of food is assured; dissipation of cells and waste and assimilable food are accomplished by

the circulation; invasion of the whole system takes place with rapid growth under the law, rapid wasting of fixed tissues ensues, affecting the heart and brain probably last, with early death of the organism. Life is only possible when the fixed tissue can survive long enough for (i.) accumulation of assimilable food supply of the cancer cell to suppress its secretion or (ii.) accumulation of excretion of the same beyond the constant, resulting in the death of the invading cell.

Thus cancer is an expression of the sum total of the immunities of the organism and an expression of the exhaustion of the fibrous tissue reaction.

Cancer can only be controlled under the law by its waste accumulating beyond the constant and in the restoration of the fibrous tissue reaction.

The first is possible only by the use of the means by which Nature achieves the object in the embryo.

The second can be attained by venesection whilst the reaction is yet possible and rejuvenation of the lymphatic system is feasible, i.e., in early mid life and in earlier life by controlling in all and sundry of the damaging immunity reactions. Probably the most damaging as far as has been made out are those due to the streptococcal group and its various mutations.

Reports of Cases.

DIVISION OF THE POSTERIOR ROOT OF THE FIFTH NERVE FOR TRIGEMINAL NEURALGIA.

By W. J. CLOSE, M.B., B.S.,

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South Australia.

I AM not aware how often the posterior root of the fifth nerve has been divided in Australia, but most authorities will agree that it is the method that must displace ganglion extirpation in all future procedures.

I am quoting the following case to find out the frequency of the operation and to show how futile most preliminary tampering proves, apart from alcohol injections. The value of the latter is to give the patient a period of rest during which he can build himself up for the operation.

The cosmetic result of posterior root division should be perfect, as it would have been in the case quoted had it not been for the two scars produced by previous interference. The contrast then with the lop-sided, stiff-jawed result of the ganglion extirpation, which I have seen several times and probably always occurs, makes one wonder why simple division was not thought of first.

H.R., *etatis* 47, consulted me in December, 1918, for severe right-sided *tic douloureux*. He said he had had it severely for five years and to a lesser degree of severity for several years previously. His nose and air sinuses had previously received thorough treatment and all his teeth had been extracted among other attempts to ameliorate it and he was rapidly becoming a drug fiend.

Further acquaintance with him showed him to be an intelligent German, who, having read a good deal about his complaint, was persuaded that operation was his only chance of cure and was therefore prepared to risk anything or to commit suicide. His emaciation bore out the statement that he could scarcely eat anything. He wore an unkempt beard and moustache, was afraid to touch either and had the typical board-like expression, scarcely daring to move his lips in speaking; when the lips or even the moustache was touched he was seized with an agonizing spasm. The pain was limited to the distribution of the superior maxillary branch and was probably entirely infra-orbital.

An injection of two mls of absolute alcohol into the infra-orbital canal gave him immediate relief. He went

home, shaved himself clean, went to work and continued to work hard for thirteen months, during which time he had complete relief.

By then, when the spasms began to recur, his general condition had greatly improved through good feeding and sleep. This should have been the time for attacking the posterior root. But we were both content to continue the injections as long as relief was obtained.

In January, 1920, therefore, he had a similar injection and relief followed for five months.

Several further injections were necessary at diminishing intervals of time and with lessening effect, until in February, 1921, they had no effect whatever. The last injection left a short line of herpes following one of the branchings of the nerve. During one injection the needle broke off in the canal and was not recovered. Where it got to I cannot tell.

The foramen seemed to be easier to discover each time and the calibre of the canal was growing larger, the bone absorbing no doubt through the inflammatory reaction set up by the injections. The thin floor of the canal, it appeared in operating later, had been completely absorbed and the alcohol must have then been forced directly into the antrum of Highmore.

In March, 1921, the herpes having healed, I was still so obsessed with the idea that the infra-orbital was the seat of all the trouble that I cut down on the foramen, chiselled out the canal, incidentally opening into the antrum. There was no inflammation in the antrum, but it was filled by a jelly-like plug of mucus which I removed *en masse*. The nerve and vessels were then twisted out. Healing was rapid and relief followed for six months, when the pain came on as severely as ever, being recognized then for the first time in the palatine branches.

In October, 1921, I was still tempted to tackle the superior maxillary branch again, so performed Lucke's operation of lifting and turning down the zygoma with the attached masseter, picking the nerve up in the pterygo-maxillary fossa and pulling it out. Relief from this was very short; in fact, he averred that he was having slight twinges when he left the hospital. The recurrence was then felt in all three branches, though only very slightly in the ophthalmic branch.

In February, 1922, it was more agonizing than ever, but his general condition was good and he insisted on my going ahead with the ganglion operation. The operation performed was the Hartley-Krause, that is, by the auriculo-temporal route, but the Spiller-Frazier method was adopted of lifting the ganglion from the *cavum Meckelii* and dividing the root between it and the foramen in the tentorium, through which the root passes. As the motor root lies to the inner and lower aspect of the nerve, I hoped to miss it by lifting the ganglion. More by good luck than management, for the oozing blocked the vision as soon as the tampon was removed, this was apparently successful, since there has been no paralysis of the muscles of mastication at all. In any case, if divided, being a motor nerve, it will usually unite in about three months. There appeared to be a complete right-sided facial palsy for two months after the operation, but the peculiarity of it was that, when given a mirror to watch the movements, he could use these muscles and then suggested that if he could feel them, he could use them.

Within three months, however, the facial muscles of both sides were working unconsciously and equally. Why this function, which was evidently lost through abolition of the muscle sense, should be restored, I am at a loss to know.

Now, five months later, there is right-sided anaesthesia and analgesia, good function of all the muscles of the face (including the *orbicularis*, whose facial branch apparently escaped injury in the incision) and of mastication. The right eye becomes a trifle injected at times, but, considering that he has bought a milk round and is constantly exposed to the cold winds, this is not serious nor surprising. If it were not for the scars of the previous operations the casual observer would not know that anything has been done, as the auriculo-temporal scar is completely covered by the scalp hair.

The greatest difficulty of the operation seems to me to be the securing of the middle meningeal artery. At least in this man, whose skull was broad (some say this is a

national peculiarity), it was so, though the same difficulty did not seem so great in the narrow-skulled corpse on which I first attempted it.

The improvised hook and ligature carrier did not act well and eventually the vessel was clipped, pulled out of the *foramen spinosum* and pressure applied.

A comparison with Cushing's infra-temporal route for giving better access to the base of the brain shows, as far as I can see, that the infra-temporal does not prove of any advantage to the auriculo-temporal and must certainly cause much more deformity and stiffness of the jaw muscles. Both methods were tried on the dead body previously to adopting the latter mode of access.

Reviews.

DERMATOLOGY.

DR. MACLEOD'S book¹ may be regarded as the best large text-book on diseases of the skin published in English. It contains 1,277 pages of text, 23 illustrations in colour (in fourteen plates) and 435 illustrations in black and white. The illustrations in colour are distinctly indifferent in drawing and in tone, while those in black and white, being generally reproductions of photographs or photomicrographs, are excellent. But black and white illustrations are poor substitutes for first-class colour reproductions such as are to be found in Jacobi-Pringle's "Atlas," or even in Norman Walker's handbook. It is much to be regretted that a poorly executed type of colour illustration should be included in a text-book of such importance. Fortunately they display reproductions of comparatively unimportant diseases, a fact which obviates the formation of false impressions of important diseases.

The text-book is excellently printed and arranged and the subject matter is of a very high order. The references are full, which, together with the excellence of the text, enhances the value of the publication.

The chapter on eczema is excellent. It would amply repay study by all practitioners of medicine, as it would dispel many false doctrines and confusions which still reign in the minds of many.

It is gratifying to find that many old errors transmitted from text-book to text-book are avoided; especially that arsenic, even in the treatment of psoriasis, is relegated to its rightful but very minor place.

The description of the tinea is very good and instructive, especially in the matter of illustrations of histopathological specimens and the cultural characteristics of many forms of fungi.

Syphilis is well handled; the systematic treatment is much better described than in any other text-book on diseases of the skin. This part of the book, too, is very valuable to all members of the medical profession and is strongly commended to their notice.

The best part of the book, however, is that occupied with the pathology and histo-pathology of the different diseases. In this department Macleod is a past-master and enthusiast. No less is expected of him; expectation is not in vain. It is impossible to particularize, as, throughout the book, this part is in the highest degree excellent and illustrated by numerous photomicrographs of very great value.

By way of contrast, the description of X-ray apparatus and technique is woefully inadequate. That only four pages are devoted to this most important part of therapeutics of diseases of skin is almost inexplicable and even then all that is said is not correct. No reference is made to the importance of voltage across the tube, no reference to filtration, no description of X-ray tubes or the manner of their functioning, no mention even of such an essential instrument as a milliamperemeter. The description of an archaic X-ray apparatus is almost as pathetic as the stripping of the shroud, for the purpose of a public *post mortem*, from the body of an ancient maiden lady of the Victorian era.

Outside this major and a few minor defects the volume is a very valuable and up-to-date book of reference.

¹ "Diseases of the Skin: A Text-Book for Students and Practitioners," by J. M. H. Macleod, M.A., M.D., F.R.C.P.; 1920. London: H. K. Lewis & Co., Ltd.; Royal 8vo., pp. 1,307, with 23 illustrations in colour and 435 in black and white. Price: £3 10s. net.

The Medical Journal of Australia

SATURDAY, AUGUST 26, 1922.

The Health of the Worker.

THE special branch of the Department of Health established with the object of introducing into Australia modern methods for the protection of the industrial worker is now emerging from the stage of preliminaries. Hitherto various sporadic efforts have been made to apply the principles of industrial hygiene to a few isolated trades, but no organized programme has been drawn up and no authority has accepted the heavy burden of responsibility for the welfare of all employed persons. The Commonwealth Government is at a disadvantage in this regard, since the control of all commercial and private undertakings belongs constitutionally to the States. No government would be foolish enough to relieve the employers or proprietors of industrial firms of their responsibility to those engaged to work for them. But governments, as public custodians, are required to set a standard of the conditions of life provided by every individual or body of individuals employing others for trade or private purposes. There will be much difference of opinion concerning the amount of interference that is necessary or proper. An attempt is made in nearly every country at the present time to regulate factories in regard to structure, sanitation, ventilation, lighting and cubic capacity of air space per worker. Usually the supervision of the factory is entrusted to an individual with little or no training in hygiene. The inevitable result is that the structural character of the factory building is judged from the aspect of the builder, while its relation to the community within its four walls is ignored. In the next place, industrial hygiene is concerned with the trade process. In England the *Factory Act* provides for numerous safeguards of varied kinds for the benefit of the employees. There is the question of dust and fumes. In certain trades machinery is used and the Act prescribes the form of guard that must be provided to

protect the workers from mechanical injury. In other trades stringent regulations are enforced to prevent ready conveyance of infection from one worker to another. An instance may be quoted in connexion with the cotton spinning trade. Many years ago it was found that syphilis, diphtheria and presumably other infective processes were propagated by the habit of "shuttle kissing," which means the sucking of the shuttle to release the free end of the thread. Employers are required to forbid "shuttle kissing" under deterrent penalties. Under certain conditions the law has been formulated to mitigate noxious elements that cannot be eliminated from a trade process. In the next place, it is a proper function of industrial hygiene to measure and evaluate the effects of every kind of employment on the well-being of the worker and to regulate employment so that deleterious influences may be minimized or removed. This chapter of industrial hygiene is extremely complicated and expansive. It includes the protection of the individual from the special trade or trade process hazards, the regulation of employment in conformity with the rules of hygiene and the elimination of avoidable conditions of work which lessen efficiency and interfere with the physiological functions of the body. Among the other important tasks included in the term industrial hygiene may be mentioned that of controlling the products of certain industries in regard to their effect on the public health. Thus in the dairy industry industrial hygiene must adopt measures to insure that the purchasing public receive milk of good quality in a reasonably pure and clean condition.

From the foregoing it will be seen that the health authority should guide the employer of labour to obey rules that can be formulated for the protection of the employee, for the benefit of the public and for the good of the nation. There should be skilled supervision by the Department and rigid enforcement of such laws as experience has proved to be advisable. Moreover, the health authority should act as the coordinating body between the responsible employer and the expert hygienist. The task is one of immeasurable importance to Australia as a nation. Its successful performance will depend on the collection of information concerning the effect

of every form of employment on every kind of worker, on the constant and complete control of the health conditions of every industrial worker in the Commonwealth and on the implicit obedience by every employer of new laws which must apply equally in all parts of the Commonwealth. The first essential would seem to be the surrender by the State Governments of their sovereign rights in regard to factory and industrial control to the Federal Government. Unless this is effected, we shall experience a want of uniformity both in legislative regulation and in administrative control. The second essential is that the responsible authority shall rely on the general medical practitioner for information concerning the incidence of ill-health attributable to industrial employment and shall utilize the general medical practitioners as its agents for the purpose of applying the measures devised for the prevention of disease and ill-health. There has been talk concerning the collaboration between the medical practitioner and the health authority for this purpose, but hitherto no indication has been given of the nature of the assistance he will be required to render. If the provisions of protection are to apply to all employed persons, it will be necessary for the Government to take a census of the employed and to classify this information. The primary details can be collected from the workers themselves. The *questionnaire* to the worker should contain among other questions, that of the name and address of his private doctor. A supplementary *questionnaire* should be sent to each medical practitioner in the reply to which some information concerning the health of the workers usually attended by him could be given. The doctor would naturally ask his patient to sanction the filling in of the replies. The form could be a simple one, designed to disclose evident signs or symptoms of disease rather than complicated diagnoses. The practitioner should receive a fee for each form filled in and returned. In the next place, the health department should clothe the general practitioner with authority to dictate modifications of the conditions of employment necessary for the improvement or maintenance of health. Under certain well-defined circumstances the general practitioner should be required to collaborate with the expert in hygiene employed by the

Government and with the medical practitioner engaged by the employer, if any. It might seem that this machinery would be extremely extensive and complicated, but in no other way will it be possible to determine the morbidity incidence among the various classes of workers. It is a fundamental principle in industrial hygiene that the measures should be preventive rather than curative and that the disease-producing elements of industry should be banished or diminished. It would be inadvisable to attempt to reach the population directly by means of a public medical service, since the ultimate responsibility for the well-being of the employees must rest with the employers.

The third essential in the scheme is that the employer shall be made to compensate every worker whose health is impaired as a result of his employment. At present the employer is responsible for compensation for injury caused in the course of employment. It is but a step further to require the employer to compensate the man or woman whose health has suffered as a result of his employment. It is suggested that employers should be compelled to insure their employees against industrial disease or ill-health in the same way as they are compelled in some States to insure their employees against occupational injury.

There are many other problems involved in this question. Dr. Lanza's suggestive and skilful address to the New South Wales Branch of the British Medical Association and the opinions expressed by others in the debate following his address have provided the medical profession with much food for thought. This thought should be the precursor of action. It is preferable for the medical profession to offer its assistance in circumstances that are acceptable to the majority than for the Government to impose on the members of that profession terms and conditions which may be undesirable.

THE DEFENCE MEDICAL SERVICES.

AFTER the storm comes a calm. But the havoc wrought by the raging torrents, by the hurling winds, by the tempestuous seas often leaves its traces for days and months. After the war came what is called peace. Years have passed since the

great armies ceased their furious slaughter on the western front, but the world to-day groans under the aftermath of unrest, of pestilences, of famines and internecine rivalry and unabated hatred. The destruction of edifices of architectural beauty, of homesteads and of industrial wealth remains largely unrepaired. The dead lie still in their early graves; no reparations can undo the human destruction. Instead of a whole-hearted combined effort to build up a saner and safer world, the nations are adding burdens to burdens until it would almost seem as if a fresh war were prevented merely by the utter financial and physical exhaustion of the great western nations. The war has taught its lessons, but, alas! little heed is being paid to these lessons. Experience has been bought dearly with a running torrent of blood. Even at this distance from the old world we are beginning to lose some of the formulæ that arose out of this bitter experience in the field. In a little time all traces of the organization that kept the fighting units up to a high degree of efficiency and numerical strength will have vanished.

War has not been banished. It may be that a renewed world war will be postponed for a long time; who knows? The nations may afford the luxury of reduced peace-time armies as long as Europe is bankrupt. But no nation can afford to destroy the fundamental organization of its medical defence forces which have proved of immeasurable value a few years ago. The proposal was put forward that the medical services should be combined and that there should be an amalgamation of the Naval Medical Service, the Army Medical Service and the Air Force Medical Service. This proposal was founded on the sensible pleas of economy, increased efficiency and general usefulness. We learn that the Director-General of Army Medical Services is about to relinquish his office because this proposal has been refused. No acceptable reason has been advanced in support of the refusal. It has not been claimed that the plea of economy is unsubstantial. It can be shown beyond question that a combined medical service could be maintained in a state of readiness for all contingencies at a much smaller cost than three separate medical branches of the three divisions of the defence forces. The con-

tention that by judicious organization and administration the efficiency of the medical officers and of the whole service would be enhanced if the training were adapted to the requirements of all three branches has been ignored. It is further an undisputed claim that the combined service would offer material advantages to more individuals as loyal citizens than would three independent services. The authorities are silent and their silence is costing the Commonwealth money, a valuable organization, the preservation of a powerful weapon of safety and the services of a most efficient officer. Sir Neville Howse is justified in refusing to be responsible for the wasteful and clumsy remnant of the Army Medical Corps, when an excellent medical service might be built on its foundation. It should be unnecessary in the year nineteen hundred and twenty-two to indicate what is the value of the medical services to a nation. In the early days of the war there were many serious mistakes which proved costly and disastrous. Later, as the Army Medical Service became more efficient and as experience became more general, this branch of the Army performed something akin to miracles. The armies were protected from serious disease in a manner undreamed of in earlier days. Men were returned time and again to the fighting lines after injuries and poisonings, a feat of medical skill and organization unknown in the past. Recruits sent abroad were fit for service; in the early stages the lame, the halt and the blind succeeded in penetrating the cordon of a delusory examination. Unless a new medical service emerges from the remains of the wonderful machine of the later period, all the experience will vanish and the next war will find the medical profession as unprepared and as inexpert as it was in 1914. The only permanent organization that can be maintained at a high degree of efficiency is a combined medical defence service. If this instrument be denied the nation, young medical graduates will discover that the wraith of the Australian Army Medical Corps is unreal. The few who will join from a sense of loyalty, will be awakened rudely to the truth that it is incapable of providing a genuine and effective training. We claim that the best instrument should be forged at once, more especially since it is at the same time economical.

HORMONES AND RACIAL CHARACTERS.

EVER since Charles Darwin established his doctrine of the evolution of the animal species, biologists have endeavoured to find an explanation for the manifold variations of structural qualities which make their appearance almost simultaneously in every evolutionary stage. It is held that the sum of these simultaneously appearing changes are needed for the development of definite functional qualities and that the characteristics of each animal at any given stage of its evolution are dependent on a complex mechanism possessing many inseparable parts. The attention of our readers has recently been directed to the views on this subject put forward by Professor Sir Arthur Keith in his Herter Lectures.¹ In the first of these lectures he dealt with the evidence available in favour of the assumption of the action of the pituitary hormone in determining the development of the jaw, the supra-orbital ridge, the zygomatic arch, the cranial structure and the nuchal platform. In the second and third lectures² Sir Arthur Keith discusses further evidence on which he claims that the evolution of the human races is determined by hormone activity. It would be impossible to convey in few words the full meaning of his arguments. Before the hypothesis can be judged, the whole of the three lectures should be read with care and thoughtful deliberation. In the following a few selected pieces of evidence are presented with the object of awakening interest in this ingenious and important study and of inciting the scientifically trained practitioner to endeavour to add further facts to fill in the blank spaces in the book of knowledge concerning the structural and functional qualities of the modern man. These extracts are prefaced by a reference to the proper conception of the word hormone. Starling produced experimental evidence in 1904 of the action of the internal secretions on the main organs and tissues of the body. He showed that bodily function is governed not only by a nervous mechanism, but also by a bio-chemical stimulation which, in virtue of its intermittence and as a result of the antagonism of different secretions, maintained a proper degree of activity or balance. He postulated chemical or chemico-physical bodies—the hormones—whose duty it is to regulate function. The popular belief that the secretions of glands like the pituitary or suprarenal act directly on tissue, such as unstriated muscular fibres, is foreign to the correct conception of hormonal action. Hormones stimulate functions which are performed by the tissues themselves. Were it otherwise, it would be impossible for a delicate balance to be maintained, such as exists in the stomach and upper portion of the digestive tract. For this reason it would be more reasonable to assume that hormones are not chemical entities but are enzymic qualities with which the organic constituents of the internal secretions are endowed.

Professor Sir Arthur Keith distinguishes between gigantism and acromegaly and holds that they repre-

sent disturbances of two correlated yet distinct growth mechanisms. The former would seem to be a disorder of the pituitary hormone mechanism presiding over the normal growth of the several parts of the body. The study of localized acromegaly indicates that the underlying disorder is not resident in the normal growth mechanism but in those hormone mechanisms which govern reactionary growth. Selecting the example of the apparatus of mastication, Sir Arthur Keith shows that under the stimulation of a special mechanism the gorilla acquires his massive and powerful jaws. The gorilla baby has a smooth and rounded skull, like that of a child. The adult ape is endowed with this special development of the masticatory apparatus. A similar condition is detected in acromegaly. In the chimpanzee the growth processes come to a halt at a stage represented in the childhood of the gorilla. He traces the characters of the European type of man to a hormone mechanism which, when exaggerated, leads to acromegaly. While the European type of racial characters seems to be dominated by hormones derived from the pituitary, the Mongolian and negro types owe their qualities to thyroid and adrenal hormones. In considering the significance of the effect of these mechanisms on the production of racial qualities, he gives chapter and verse for the fact that the human qualities of nakedness of skin and absence of pigment are actually present in the foetus of the anthropoid apes. The qualities are transient in the ape, but become fixed in the human being. His hypothesis provides for an automatic action of the hormone mechanism which fixes the characters of each race. While growth stimulation is regarded as a function of several of the hormones, pigmentation would appear to be a function of the hormones of the suprarenal gland. Moreover, Sir Arthur Keith anticipates that future research will reveal an intimate association between growth mechanism and the regulation of temperature. He is inclined to correlate with these qualities that of pigmentation of the skin and its appendages. In the next place he examines the evidence of the action of excess of hormone production by the thyroid gland and also of a deficiency of production. The effect of thyroid extract on the growth of cretinoid children and on the metamorphosis of tadpoles are but two instances contributing to this deduction. He argues on sound grounds in favour of a similar pathology of Mongolism and achondroplasia. There are some arresting facts to be related in regard to the latter condition. It will perhaps be within the ken of many that Darwin described a "bull-dog" breed of cattle from the Argentine, a breed corresponding to achondroplastic children. Dwarf races and dwarfism provide much further evidence in support of the contention that racial characters may be reproduced in human beings of other types as a result of a disorder of the hormone mechanism.

The pathology of the adrenal and suprarenal glands provides a further chapter in the study of the influence of hormones on the evolution of races. The cortex of the adrenal glands exerts a powerful influence on growth. Hypertrophy with increased glandular activity leads to the premature develop-

¹ THE MEDICAL JOURNAL OF AUSTRALIA, June 22, 1922, page 97.

² Bulletin of the Johns Hopkins Hospital, June, 1922.

ment of all those bodily functions that normally are awakened at the time of puberty. The changes induced by these hormones are called "secondary sexual characters." Hyperplasia and over-function in young males result in precocity of sexual structure and function; in the female the effect is the development of male qualities. The removal of the hyperplastic adrenal leads to a disappearance of these male qualities and a return to the normal female configuration of body, mind and voice. Similarly the qualities over which the adrenal glands preside, characterize the various human races. Sir Arthur Keith would regard the woolly hair and the thick, everted lips of the negro as non-anthropoid qualities of recent origin. Large *labia majora* are qualities of the European type and are met in the foetal stages of the ape and in human beings. The European has acquired this quality by the fixation of an anthropoid foetal character. He further suggests that the adrenal is concerned in the determination of the duration of the several periods of life. He refers to some celebrated infantile persons who have retained the size, appearance and bodily qualities of infancy or childhood for extraordinarily long periods. The condition known as progeria, in which a child acquires the appearance of an old person, is also attributed to a disturbance of the adrenal hormonal mechanism.

It is admitted that the evidence is incomplete and that proof can only be anticipated when many further facts have been discovered and elucidated. Sir Arthur Keith, however, claims that a *prima facie* case has been made out for the hormone hypothesis to explain growth and evolution. He asks his readers to examine the pieces of evidence available at present with care. There would seem to be little doubt but that hormone systems represent automatic growth mechanism which, like all living qualities, are hereditary and variable. New characters do not appear at the end of a developmental stage, but early in the growth of the foetus. They become fixed in the adult stage. It is remarkable that he has avoided all argument based on speculation concerning the relation between pathological changes in the organs of internal secretion and structural and functional abnormalities or divergencies from the normal. It is easy to attribute a symptom complex to a so-called "endocrine disturbance," but he demands definite proof before he is prepared to admit the association. Advancement in knowledge must depend on a strict adherence to this demand.

ELECTRO-GASTROGRAPHY.

RADIOLOGISTS have frequently described different types of peristaltic waves in the stomach wall and these differences have been both in rate, place of origin and intensity. Reynolds, Lawrence and McClure investigated gastric peristalsis both in healthy individuals and in persons suffering from gastric and duodenal ulcers. They showed by means of the fluoroscope that in the healthy stomach peristaltic waves begin near the cardiac end at uniform intervals of about twenty seconds, gradually deepen and progress in a regular fashion to the region of

the pylorus. In the stomachs of patients suffering from gastric or duodenal ulcer abnormal waves were observed. The abnormalities consisted of exaggeration and irregularities of the waves sometimes with spasm of the musculature, causing the appearance of the so-called *incisura*.

The question has been further studied by Dr. W. C. Alvarez.¹ He investigated the peristaltic waves of the stomachs of animals and recorded them by means of delicate enterographs. The animals used were cats, rabbits and dogs. In some the observations were made on the excised stomach kept in warm Locke's solution. In other cases the animal was placed under urethane anaesthesia and the abdomen opened under Locke's solution. Light levers were fastened to the peritoneal coat and the contractions recorded by enterographs. Many varieties of contraction were noted, starting in different places and spreading in various directions. The rate varied considerably; the length of time required for the passage of a wave from the cardiac to the pyloric end of the stomach was from seven to twenty-one seconds. Occasionally a systole of the whole organ occurred. Dr. Alvarez attaches importance to the fact that the fundus and *pars pylorica* frequently contracted with distinctly different rhythms in a similar manner to that noted in the auricles and ventricles in cases of heart block. He suggests that the pyloric end of the stomach and the fundus are the representatives in man of the gizzard and crop in birds. In assessing the value of these observations it must be remembered that the incision of the abdominal wall might possibly interfere with the gastric motor phenomena in a reflex manner, while the conditions under which the contractions in the excised organs were observed would hardly be comparable to those obtaining when the organ was *in situ*. Records were also obtained from stomachs prepared in this way, by means of a sensitive d'Arsonval galvanometer and similar tracings resulted from applying non-polarizable electrodes to the shaved skin of the abdominal wall of rabbits. A good electro-gastrogram was also obtained by applying the electrodes to the thin abdominal wall of an old woman in whom the gastric waves could be seen. The apparatus failed to give satisfactory results in persons with good muscular development of the abdominal wall. Dr. Alvarez states, however, that he can obtain records by means of an intragastric electrode which is introduced like an Einhorn tube. This is a small calomel electrode four millimetres in diameter and two centimetres long. Tracings can be obtained in the case of patients with achlorhydria, but not in those with normal acidity.

Dr. Alvarez's work is admittedly only in the experimental stage. It will be necessary to discover an electrode suitable for use in all varieties of gastric secretion and to establish more definitely the types of gastric contraction which can be regarded as normal. Excessive contractions are generally present in lesions which are recognizable without recourse to this method of investigation.

¹ The Journal of the American Medical Association, April 15, 1922.

Abstracts from Current Medical Literature.

DERMATOLOGY.

Lymphoblastic Erythrodermia.

J. H. SEQUEIRA, with PHILIP PANTON (*British Journal of Dermatology and Syphilology*, December, 1922) describes three cases which are characterized by a general erythrodermia and a specific change in the blood. He regards these as symptoms of a disease to which it is at present impossible to assign a cause, the blood picture being sufficiently distinctive to render diagnosis possible from the erythrodermias, including that of *mycosis fungoides*. The first case was that of a man, aged sixty, who complained of a red patch on the shoulder which gradually spread over the whole body, the skin everywhere being of a brick red colour. The surface generally was smooth and there was a superficial oedema present in the lower extremities, accompanied by slight scaling. The eruption itched intensely and had done so from the first; the superficial lymphatic glands in the cervical, axillary and inguinal regions were enlarged and movable, but not tender. The urine, spleen and liver were normal and the patient's blood did not react to the Wassermann test. Blood examination showed that the erythrocytes were 4,500,000; leucocytes, 8,000, of which small lymphocytes were 42%. The patient was treated in and out of hospital for six years, when he was shown a second time before the Royal Society of Medicine. No change had taken place in the condition of the skin. The scalp and eyebrows had become denuded of hair, but the eyelashes remained. He became mentally affected at this time. There was a considerable increase in his leucocytic count. Pathological examination failed to detect any evidence of lymphadenoid leucæmia and there was nothing to favour the diagnosis of *mycosis fungoides*. The patient's mental condition became gradually worse and he finally died. The other two cases reported are similar to the above. The authors are of the opinion that the condition is specific and that it is probably more common than would appear from the literature. They observed nothing to indicate a protozoal, toxic or metabolic origin and, having been unable to suggest its ætiology, they have given the condition the name lymphoblastic erythrodermia.

Hæmatogenous Infection in Trichophytia.

E. BRUGSGAARD (*British Journal of Dermatology and Syphilis*, May, 1922) states that cases of *trichophyton profunda* (kerion Celsi) with severe symptoms of inflammation are often accompanied by acute exanthemata of varying appearance. This is especially true in children. These exanthemata often spread rapidly over large areas of the surface of the skin

and show a distinct symmetry. The eruptions are accompanied by more or less pronounced generalized symptoms, such as fever, swelling of the lymph glands and spleen and joint affections. In the majority of cases the *lichen trichophyticus* is found characterized by small, peri-follicular pale or deep red papules, especially localized to the chest and abdomen. It may easily be mistaken for *lichen scrofulosorum*. Sometimes eruptions are found which resemble measles and scarlet fever and are accompanied by definite generalized symptoms. At other times there are symmetrically arranged papules and nodes that in localization and appearance strongly resemble *erythema multiforme* and *erythema nodosum*. As proof of the hæmatogenous dissemination of the fungus, the author quotes an instance of a man whose chin, sub-mental and sub-maxillary regions were covered with large, sharply defined tumours, giving the characteristic picture of *kerion Celsi*. He was admitted to hospital and the fungus was demonstrated in the pus. Two days after the patient's arrival, acute eruptions were observed on both forearms. They consisted of bluish red, discrete papules which increased rapidly in size. Within twelve hours minute pus foci were seen on the surface. A fresh node was excised and cultures made which grew fungus identical to that in the primary focus of the skin. With regard to the treatment of *trichophyton profunda*, the author states that, as the disease is self-limited, no applications are indicated beyond weak solutions of boric acid, Goulard's extract and disinfection of the surrounding parts with iodine. The applications of the X-rays and the use of ointments are contraindicated.

Yeast Infections of the Skin.

S. S. G. REENBAUM AND J. V. K. LAUDER (*Archives of Dermatology and Syphilology*, March, 1922) state that the most important and most frequent dermatological condition caused by yeasts is blastomycosis. This is a deep-seated lesion characterized by the formation of warty growths and deep abscesses. Yeast infection may occur superficially, thrush being the best-known instance of this. Thrush, caused by *Oidium albicans* and certain species of monilia, occurs as a white adherent membrane on an erythematous base, most frequently on the oral mucous membranes of children. It may also exist as a mycosis in the vagina, on the nipples of nursing women and as a dermato-mycosis. An instance of this was reported by Schamberg in an infant six months of age. On both sides of the face were sharply margined red patches, some of which were circinate and closely resembled ringworm; an extensive eruption existed on the vulva, *mons veneris*, thighs, perineum and buttocks. The duration of the eruption was about two months. The nipples of the mother were also the site of thrush lesions which had the appearance of an eczema. *Oidium albicans* was isolated both from the mother and the infant. In the in-

stances reported by the authors they distinguish two types of lesions. One of these is dry, showing a bright red dermis under a smooth and glistening epiderm. The other type is an accumulated mass of undermined, sodden epiderm. These cases all resembled ringworm and a diagnosis could not be made apart from laboratory studies. The condition is readily amenable to treatment by 10% tincture of iodine. It is important to keep the lesions dry. The only case which did not respond to the usual method of treatment, was that of a woman who frequently put her hands into water in the course of her household duties.

Eczema Hiemale Prurienti.

FRIEDRICH SCHULTZE (*Münchener Medizinische Wochenschrift*, February 3, 1922) describes a condition of pruritus from which he suffered for many years. Every winter he experienced a recurrence of this pruritus, which was practically confined to the legs and lower portions of the thighs. The itching appeared chiefly at night, when he was in bed, and disappeared towards the morning. It reappeared at night, especially if he remained in an artificially heated room. As this condition tended to disappear towards the end of the winter or the beginning of the spring, he maintains that it was not a simple pruritus, neither was it a *pruritus senilis*. With the onset of itching small papules, red in colour, appeared. These papules were easier to feel than to see and a number of them appearing together coalesced to make a large area of inflammation almost as large as a man's hand. On the surface of this erythema squames would arise, so that the picture at times was one of *eczema squamosum*. The author looks upon this condition more as an irritant winter eruption than either an urticarial or eczematous outbreak. He blames the dry air in artificially heated rooms more than the cold of the winter. The only relief from the itching that he experienced, was after the application of cold water bandages.

Scleroderma (Sclerodactyl Type).

J. H. SEQUEIRA (*Proceedings of the Royal Society of Medicine*, March, 1922) reports an instance of scleroderma coming on during pregnancy. When three months pregnant the patient's hands and feet became swollen and painful. This condition gradually increased in extent. The skin over the affected parts was tough, inelastic and unpinchable. Pigmented areas were present, both on the sclerosed areas and on the normal skin. There was no alteration in sensation. Treatment used was regular massage and the administration of thyroid gland extract. A patient with a similar condition, reported by Graham-Little, underwent two operations in which thyroid gland was engrafted into the tibia. Improvement followed on each occasion. She finally had all her teeth extracted and the improvement was beyond recognition. This seems to indicate a toxic causation of the condition.

RADIOLOGY.

Gastric Motor Phenomena.

LAWRENCE, REYNOLDS AND C. W. MCCLURE (*Archives of Internal Medicine*, January, 1922) contribute an article on the results of fluoroscopic observations of the stomachs of normal men and of patients suffering from ulcer of the stomach and duodenum. The meal used consisted of one hundred and sixty grammes of finely ground lean beef and forty grammes of barium sulphate baked in a loaf and ground into a mush just before use with one hundred and fifty to two hundred cubic centimetres of water. Observations were made immediately after swallowing and at varying intervals afterwards until the stomach was empty. The meal was found to fill three-quarters of the stomach and air bubble filled the remainder. As the stomach emptied, the food gradually became lower, until finally only the pyloric section was visible. In the case of hypotonic stomachs the food did not pass into the duodenum unless the patient was reclining. In normal subjects, every peristaltic wave passed food through the pylorus, but when the peristalsis was superficial there was no passage of food until the rate and vigour increased. Peristaltic waves started at about the junction of the proximal and middle thirds of the stomach and gradually increased in intensity towards the pylorus. The passage of waves was noted to be the same whether the meal was taken dry or with fluid. For thirty or forty minutes after the meal was taken in the dry state, it was noted that the gastric outline was very irregular and only gradually assumed its normal smooth character. All the stomachs examined in this series had some of the meal remaining in them after five hours and one had a seven-hour residue. The duodenal cap was not so well defined by this method as by the usual barium suspension meal. The authors paid special attention to variations of peristalsis in the presence of disease. Diseased areas showed absence of peristalsis, while in the presence of ulcer exaggerated and irregular peristalsis, pyloro-spasm, *incisura* and anti-peristalsis were observed. In duodenal ulcer a regular exaggerated peristalsis was present and when pain occurred the waves became irregular, becoming regular again on the cessation of the pain. The authors claim that their work rather disproves Hurst's theory that distension is necessary to cause gastric pain, although they admit that pain may be produced experimentally by over-distension.

Electro-Therapy in Gynaecology.

A. ZIMMERN (*Archives of Radiology and Electrotherapy*, March, 1922) draws attention to the lack of knowledge among medical men of the use of electricity in the treatment of various gynaecological conditions. The success of electro-therapy depends on accurate diagnosis. The author enumerates the various conditions in

which it is of benefit and describes the methods used in the treatment of various forms of metritis and of cervicitis. Chronic cases receive the greatest benefit and the method is contra-indicated in acute or chronic inflammatory conditions of the ovary or tube. In chronic metritis with hæmorrhage, the positive anode in the form of a carbon sound is introduced into the uterus and from twenty to forty milliamperes of current passed for five to ten minutes. Five repetitions may be necessary for cure, but as a rule hæmorrhage quickly ceases. If hæmorrhage is not severe, the sound is used as the negative electrode and from fifteen to thirty milliamperes passed for about five minutes. Leucorrhœal discharge may increase for a time after a sitting, but gradually disappears. In cases of cervicitis, especially of gonococcal origin, ionization is used with silver as the positive pole and a dosage of twenty milliamperes passed for five minutes twice weekly for three weeks. In cervical stricture the negative pole in the form of a nickel or silver sound is introduced into the cervix and after the current has passed for a time the electrode will be found to lie loosely in the canal. It is then withdrawn and the process repeated in four days with gradually increasing sizes of electrodes. A current of from four to fifteen milliamperes (never more than fifteen milliamperes) is passed for about three minutes at each sitting. Permanent cure is the rule.

Colonic Peristalsis.

PRESTON M. HICKEY (*American Journal of Roentgenology*, April, 1922) describes a simple method of examining colonic peristalsis. It is an easy matter to follow the peristaltic movements in the stomach and duodenum by the ordinary meal methods, but colonic action is slow and infrequent and is but rarely seen on the screen. An ordinary cleansing enema is given and then the usual barium enema through a rectal tube. The tube is disconnected from the can after the enema has well distended the colon and rectum and the enema is allowed to flow back into a bucket. The over-distension stimulates the colonic and rectal peristalsis. The rectum rapidly empties and this is quickly followed by an emptying of the sigmoid, no peristaltic waves being seen, but only a tightening or squeezing of the sigmoid colon. Peristaltic action now commences at the junction of the middle and proximal thirds of the transverse colon and partly empties the transverse into the descending colon. Here the action stops for a time, but soon peristalsis reappears and empties the contents of the transverse and descending colons into the sigmoid. When these are partly empty the peristaltic waves appear in the caecum and empty both it and the ascending colon rapidly. In atonic constipation, peristalsis is slow in starting, but massage will supply the necessary stimulation for its commencement. In cases where caecal retention has been seen at meal examination, Hickey has shown that there

is a definite spasmodic contraction of the caecum about the junction of the upper and middle thirds of the organ. Several obscure spasmodic conditions of the transverse colon have been satisfactorily investigated by this method.

Pneumo-Peritoneum.

J. T. CASE (*American Journal of Roentgenology*, December, 1921) reviews the year's work on pneumoperitoneum. He advises caution in the procedure and states that the operation should be treated with the respect due to any surgical event. Bad surgical risks, such as cardiac and circulatory disease, contra-indicate pneumoperitoneum. Carbon dioxide or a mixture of this gas with oxygen is used. The injection must be slowly done and over-distension guarded against. Morphine may be necessary for pain. The procedure is very unpopular among patients and most people would prefer abdominal laparotomy to pneumoperitoneum. It occupies much time and rather disorganizes the routine work of the radiographic department. Interstitial emphysema and over-distension can be easily avoided and the latter can be relieved at times by deflation. Patients with adhesions suffer acutely. Intestinal puncture was noted in two patients, but as the inflation was being carried out under screen control, it was recognized immediately and no untoward result followed. Puncture of the mesenteric blood vessels or of the abdominal viscera is very likely to occur when adhesions are present. It is possible to light up latent infections when examining pelvic conditions, especially if trans-uterine inflation is practised. Myocardial inefficiency and valvular disease contra-indicate inflation. Air embolus and cardiac failure caused two deaths. Case considers the method one for the well-equipped clinic only and states that its greatest use is in the diagnosis of subphrenic conditions and retro-peritoneal tumours. The use of the Potter-Bucky diaphragm will greatly reduce the number of cases in which pneumoperitoneum has been found of use.

Teleangiectasis Treatment.

H. H. HAZEN (*American Journal of Roentgenology*, February, 1922) describes the result of ultra-violet treatment of Röntgen teleangiectasis. Teleangiectasis is a frequent accident following radiation by X-rays and radium, is disfiguring, causes much mental discomfort to the patient and hitherto has not yielded to any known form of treatment. The dilated vessels are accompanied by glandular and skin atrophy. The author uses the Kromayer lamp with the quartz compression lens and gives an exposure of from fifteen to twenty minutes. Two exposures at most are required to obliterate the small vessels, which disappear completely, leaving only the skin atrophy and a soft white scar. Eight cases have so far been treated with complete success.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association was held at the Alfred Hospital on July 5, 1922. The members of the staff presented patients and read the notes of the clinical conditions. Owing to the large number of patients shown, several demonstrations had to be held simultaneously. There was no discussion.

Myoclonic Type of Encephalitis Lethargica.

DR. A. V. M. ANDERSON showed a boy, aged fourteen years. After a prodromal period of eight days the boy had been seized with an epileptiform convulsion. A transient external strabismus was noted. Evidence of a lesion of the pyramidal tract was furnished by a diminution of the superficial abdominal reflexes on the left side and the presence of an extensor plantar reflex and of left patellar clonus. A pleocytosis of lymphocytic character was discovered in the cerebro-spinal fluid.

Pulmonary Fibrosis.

DR. ANDERSON also showed a man with pulmonary fibrosis of obscure origin. The patient was thirty-four years of age. He had been admitted to the hospital on account of a feeling of tightness across the chest. There were no other subjective symptoms. The physical signs of pneumonia at the base of the right lung were noted. After the lapse of ten weeks a dull percussion note and high pitched, weak breath sounds were still persisting at the base of the right lung. There was a slight displacement of the heart to the right and a not well-defined Grocco's triangle was detected. The blood serum failed to react to the complement fixation tests for syphilis or for hydatid disease.

Auricular Fibrillation.

DR. M. D. SILBERBERG demonstrated a series of patients with cardiac disease in whom auricular fibrillation had supervened and who had been treated with quinidine sulphate. Dr. Silberberg demonstrated the effect of the drug by exhibiting electro-cardiographic and polygraphic tracings.

Tuberculous Lymphadenitis.

DR. C. E. DENNIS showed several patients in whom beneficial results from X-ray therapy had been obtained. Among the conditions treated was acute tuberculous lymphadenitis. The patient, a young man, had been admitted with a large mass in the upper portion of the right side of the neck. In the lower part of the neck the glands had been more discrete. The tuberculous nature of the affection had been determined by pathological examination of an excised gland. Operation had been undertaken, but had to be abandoned. Complete resolution had been achieved by X-ray treatment. Only a few small, shotty glands could be palpated.

The second patient had been treated for a tuberculous cervical adenitis with a suppurating sinus by Röntgen rays. The treatment resulted in the healing of the sinus and subsidence of the enlarged glands; there was a concomitant great improvement in the patient's general health.

Ossifying Lympho-Sarcomata.

DR. DENNIS's third patient was suffering from multiple ossifying lympho-sarcomata of the upper part of the chest and of the neck. Recurrence of the growths had followed a number of attempts to eradicate them by surgical means. The recurrent deposits had resolved under the influence of X-ray therapy and the patient was at present free from evident tumours.

Osteo-Sarcoma of Ilium.

The fourth patient had been subjected to X-ray treatment for an osteo-sarcoma of the ilium. A skiagram was exhibited to demonstrate the large size of the tumour. The patient had suffered very much pain on account of involvement of the pelvic nerves in the extension of the tumour. The neoplasm had receded under X-ray treat-

ment. The skiagraphic appearances had been modified in that the shadow of the tumour had become of greater density. Dr. Dennis interpreted this change as an indication of sclerotic changes in the bone.

He also exhibited a number of interesting skiagrams mounted in a viewing frame.

Goitre.

DR. J. P. MAJOR presented a number of patients with various types of goitre, simple, adenomatous and thyrotoxic. The series provided opportunity for studying the effects of medical, surgical and X-ray treatment.

Amyotrophic Lateral Sclerosis.

DR. J. F. MACKEDDIE presented a series of patients suffering from various nervous affections. The first patient was a married woman who had been ill for two years. She had first noticed an awkwardness of the tongue in speaking. Later she had had difficulty in eating. The symptom spoken of as "slavering" had then appeared. The patient had suffered little or no pain. There had been rapid wasting. The physical signs were limited movements and wasting of the tongue, fibrillation of the tongue and of the sterno-mastoid muscles, excessive deep reflexes and possibly Babinski's reflex. There was a typical *main en griffe*. Electrical examination revealed a mixed form of a reaction of degeneration of the affected muscles. The diagnosis of a primary bulbar type of amyotrophic lateral sclerosis was made.

Lesion of the Cauda Equina.

The second patient was a man who had had a bad jolt in the saddle fourteen months before admission to hospital. This had been followed by pain in the left leg. The patient stated that the pain had assumed the characters of sciatica, from which several members of his family had suffered. He stated that he could not put his trousers on while standing on his left leg and that he had lost the use of the left leg in other ways. He complained of more or less constant pain. The physical signs were absence of the *tendo Achilles* jerk, diminution of the dorsi-flexion of the foot in opposition to resistance, diminution of all forms of sensation from below the buttock to below the knee, diminution of epicritic and protopathic sensation, dissociation of deep sensation, loss of sensation to deep pressure and to vibration with retention of the joint sense. There was a perforating ulcer of the sole of the foot. A lesion of the *cauda equina*, simulating sciatica, was diagnosed.

Myasthenia Gravis.

The third patient was a married woman who had noticed for four years previously that she was seeing double. She had tired easily while eating, talking, walking, etc. There had been no disturbance of sensation. The physical signs included incomplete external ophthalmoplegia, diminution of the field of vision, ptosis and the myasthenic reaction. There were no bulbar symptoms or signs and a total absence of other neurological signs. The condition was recognized as *myasthenia gravis*.

Arsenical Neuritis.

DR. MACKEDDIE's fourth patient, an unmarried woman, had had an overdose of arsenic six weeks before admission to hospital. She had severe gastro-intestinal symptoms. The epicritic sense was defective, while the protopathic sense was normal. There was loss of sensation to deep pressure. There was no dissociation.

Cerebral Syphilis.

The fifth patient was a female who had noticed a weakness of her legs and a dragging of her feet for about twelve months. She had discovered two months before admission that she was unable to articulate properly. The physical signs elicited were internal ophthalmoplegia, aphasia and dysarthria, increase of the deep and superficial reflexes to a slight, but probably not to a pathological degree, total loss of sensation to touch and pain, which was attributed to the mentality of the patient. There was no loss of control over the sphincters. The blood serum yielded a Wassermann reaction. A lymphocytosis

of the cerebro-spinal fluid was present. The diagnosis of cerebral syphilis with internal ophthalmoplegia was registered.

Spastic Paraplegia.

DR. MACKEDDIE's sixth patient was a married woman who had noticed that her legs appeared to be heavy over a year before admission. She had found that she wore out the soles of her shoes at the toes. She became easily tired, but suffered no pain. Dr. Mackeddied had found that, notwithstanding the existence of spasticity for twelve months, there had been no neurological signs beyond the absence of both abdominal reflexes in a flaccid abdominal wall until a week before admission. Then double ankle clonus had been elicited and Babinski's reflex was probably present. There were no signs of psychic disturbance. The serum did not react to the Wassermann test. The discs were normal. The diagnosis lay between disseminated sclerosis and spastic paraplegia.

Friedreich's Paraplegia.

DR. MACKEDDIE presented a man in the final stage of Friedreich's paraplegia, with all the classical signs and symptoms well developed. There had been an early onset. The family history revealed the occurrence of the disease in other members.

Hysteria.

DR. MACKEDDIE's last patient was a man who had been admitted to the Alfred Hospital in a stuporose condition. As soon as it had been possible to examine the patient, it had been found that there was a general spasticity of the right side of the body. The deep reflexes were increased, but it was uncertain whether Babinski's reflex was present. There was complete anaesthesia of the right side of the body, while a slight degree of anaesthesia was noted on the left side. Notwithstanding this, there was hyperaesthesia when the patient was handled. The gait was myotonic and festination was noted. The patient hurt himself against a wall. He passed sleepless nights. He had had a similar attack some years previously. His serum failed to react to the Wassermann test. At first the condition had been regarded as a basal ganglion lesion involving the optic thalamus. The diagnosis of hysteria had then been made, chiefly on account of the complete anaesthesia of the right side.

Bone and Joint Affections.

MR. FAY MACLURE showed a patient, a boy aged fourteen years, with multiple foci of osteomyelitis. Four years before admission a suppurative osteomyelitis of the lower extremity of the left tibia had appeared and had given rise to distension of the ankle joint with pus. The infection had appeared in both knee joints, the head of the humerus on the left side, the left wrist joint and in the right and left hip joints. The questions for consideration were the source of the multiple infections and the best course of treatment to pursue. Vaccine therapy had been of no assistance.

MR. FAY MACLURE's second patient was a man, aged fifty-two, who had been admitted to hospital on April 24, 1922. Four weeks previously he had "strained his foot," which had become swollen and painful. Osteomyelitis of the internal cuneiform bone had been diagnosed. In hospital the condition had been treated by complete fixation in plaster, but suppuration had ensued, necessitating incision and evacuation of the pus. The foot had been kept at rest for nine weeks. Mr. Maclure sought advice whether or not the affected bone should be gouged out in order to insure non-recurrence of the condition.

He also presented a patient with syphilitic epiphysitis in the neighbourhood of the right elbow joint, left knee and ankle joints.

His fourth patient, a youth aged seventeen years, was under treatment for multiple osteomata. Bony outgrowths were present in the proximal portions of the right tibia, the right humerus and the left tibia and in the distal ends of the right and left femora. Pressure symptoms had necessitated the removal of an exostosis from the left tibia.

MR. FAY MACLURE presented a female patient, aged twenty-five, on whose knee, elbow, wrist and ankle joints on both sides were numerous exostoses. At the time of the patient's admission to hospital both knee joints were flexed to an acute angle. Excision of the joint had been carried out on both sides and the limbs straightened.

His sixth patient, a girl, aged twelve, was shown to illustrate the condition known as "sabre tibia." Bowing and thickening were apparent. Skiagrams were exhibited to demonstrate the sclerosis, encroachment on the medulla and other characteristics. The patient's serum reacted to the complement fixation test for syphilis.

The last patient of the series was a man, aged sixty-six years, who had suffered from *osteitis deformans* for fifteen years. He displayed pronounced bowing of the tibiae and a great increase in thickness of the bones of the skull. He had suffered a spontaneous fracture of the humerus as a result of advanced myelomatous changes.

Ectopia Vesicae.

MR. MACLURE also presented a male patient, aged fifty-nine years, in whom absence of the umbilicus, extroversion of the bladder, non-fusion of the pubes and epispadias were present. He had recently undergone an operation for the cure of an inguinal hernia.

Cysts in Defects of the Skull.

MR. R. ST. CLAIR STEUART showed three ex-soldiers in all of whom had occurred cysts in the area of operation for repair of an hiatus in the skull. In all the original trauma had been a gun shot injury causing destruction of portion of the cranial bones and operative attempts had been made to repair the defects by bone-grafting. At varying intervals in the several instances pressure symptoms and epileptiform fits had supervened. Operation at this stage showed the presence of cysts between the internal surface of the graft and the *dura mater*.

Arthrodesis of the Knee Joint.

MR. ST. CLAIR STEUART also presented a patient in whom arthrodesis of the knee joint had been performed to remove the disability caused by a gun shot injury after arthroplasty had failed owing to loss of the *quadriceps extensor* muscle. In the same man the operation of arthroplasty on the ankle joint had been successful.

Protein Therapy in Rheumatoid Arthritis.

DR. WALTER SUMMONS called attention to the results obtained in acute and severe rheumatoid arthritis by injections of non-specific protein. The patient, a young man, became acutely ill in December, 1921. Practically all the joints were affected and fever had persisted for two months. There was a history of a former gonococcal urethritis and the patient's blood serum reacted to the Wassermann test. Skiagrams were exhibited to show the changes characteristic of rheumatoid arthritis. Treatment had included a graduated series of injections of *Bacillus coli* vaccine on the basis of non-specific protein therapy; the last dose administered was one of four hundred millions. The man was getting about, although at one stage it appeared that he would be permanently bed-ridden.

Silver Wire Filigree in Hernia.

MR. BALCOMBE QUICK showed several patients to demonstrate the utility of the silver wire filigree in the repair of large incisional herniae.

Tube Grafting.

MR. R. C. BROWN showed a man, aged sixty-five, from whom a large epithelioma of the lower lip had been removed. Repair of the deficiency thus caused was being effected by means of a Gillies's tube graft. The first stage of this operation had been completed.

A second patient exhibited multiple keratosis of the cheek and had recently had a large epithelioma removed from the neighbourhood of the angle of the jaw. The first stage of the grafting operation had also been completed in this patient.

Filariasis.

MR. A. J. TRINCA presented a woman, aged forty-six, who had complained of a brawny oedema of the right leg of three years' duration. Ulceration was present on the dorsum of the great toe. No *Spirochaeta pallida* had been found in the secretion from this sore and no histological evidence of syphilis had been discovered in sections. The Was-

sermann test had been applied to the blood serum, but no reaction had been obtained. The woman had had her left leg amputated in 1912 for a similar condition. Although no filariæ had as yet been demonstrated, it seemed probable that the condition was one of elephantiasis.

Skin Affections.

DR. C. G. CROWLEY had assembled several patients and demonstrated an interesting variety of dermatological conditions. In addition to the more common skin diseases, there were the following rarer types: *Lupus erythematosus* starting at twelve years of age; *erythema indurata scrofulosorum* (Bagin's disease); *keratosis follicularis* (Darier's disease); *urticaria pigmentosa* in an adult; ringworm of the scalp in an adult; lymphangiectases of the skin; extensive leucotrichia and leucoderma; *lichen spinulosus*; a combination of *lichen planus*, hypertrophic, basal and squamous celled carcinoma on the face; keratosis of the skin developing into rodent ulcer and epithelioma.

Leukoplakia.

MR. J. KENNEDY showed two patients with leukoplakia. The first patient was suffering from a slowly progressive form of visceral syphilis. The spleen was enlarged and the heart action was very irregular, with numerous extrasystoles. The patient's blood serum, although he had been under treatment for two years with nov-arseno-billon and mercury, still reacted to the Wassermann test.

The second patient first attended the Alfred Hospital on May 30, 1921, complaining of a sore tongue. All stages of leukoplakia were to be observed, but no history of syphilis could be elicited. A Wassermann reaction was obtained. The tongue lesions had cleared up under anti-syphilitic treatment.

Operations on the Labyrinth.

DR. S. A. EWING exhibited a series of models and specimens of the labyrinth by Dr. L. Girard, of Paris, designed to show the various stages of the labyrinth operation as carried out by Girard.

He also showed Sluder's latest model of tonsil guillotine.

Frontal Sinus Operation.

DR. H. BARRY THOMSON AND DR. E. W. GUTTERIDGE presented a man in whom a radical operation on the frontal sinus had been performed in the presence of a large nevus of the forehead on the same side. A free vertical incision extending from the bridge of the nose almost to the hair had been resorted to in order to overcome the difficulty occasioned by the presence of the nevus.

Malignant Stricture of the Œsophagus.

They also showed a patient with malignant stricture of the Œsophagus associated with paralysis of the left recurrent laryngeal nerve.

Laryngitis.

DR. H. B. THOMSON AND DR. E. W. GUTTERIDGE also showed patients to illustrate chronic hypertrophic laryngitis with right antral and ethmoidal suppuration as causative factors (improvement had followed operative treatment of the sinusitis) and secondary syphilitic laryngitis in a patient in whom the primary lesion appeared on the fauces.

Oto-Rhino-Laryngological Conditions.

DR. BRYAN FOSTER's patients were suffering from atrophic rhinitis, malignant ulceration on the left side of the base of the tongue with adhesion of the tongue to the anterior pillar of the fauces and involvement of a lymphatic gland on the right side and mastoiditis complicated by cerebral abscess.

Ophthalmic Conditions.

DR. E. L. GAULT showed several patients. The first was a man exhibiting oxycephaly or "tower skull" accompanied by optic atrophy.

In the second patient, a little girl, he was able to demonstrate the restoration of the upper eyelid by a pedicle graft from the arm. The operation had been rendered necessary by cicatricial ectropion which followed burns.

The third patient was a man with interstitial keratitis as a manifestation of acquired syphilis. The blood serum yielded a reaction to the Wassermann test. Dr. Gault emphasized the rarity of interstitial keratitis in acquired syphilis as opposed to its frequency in the hereditary disease.

The fourth was a young woman with chronic blepharospasm affecting the left eye. The condition had been treated by injections of absolute alcohol into the branches of the seventh nerve to the *orbicularis palpebrarum* and had been arrested for a period of two months to date.

Dr. Gault also demonstrated the ophthalmoscopic appearances in various other patients.

A MEETING of the New South Wales Branch of the British Medical Association was held at the B.M.A. Building, 30-34, Elizabeth Street, Sydney, on July 28, 1922, Dr. T. W. LIFSCOMB, the President, in the chair.

Industrial Hygiene.

DR. A. J. LANZA read a paper on "Industrial Hygiene and the Medical Profession" (see page 231).

PROFESSOR H. G. CHAPMAN expressed his approval of the thoughtful exposition on industrial hygiene which Dr. Lanza had placed before them. During a period of about thirty months he, together with a number of other practitioners, had been concerned with an investigation of the conditions of industrial hygiene in Broken Hill. During the course of these investigations they had become aware of many of the facts that Dr. Lanza had described. The experience in Australia in regard to the endeavour to reduce miners' phthisis as a menace to the health of miners exemplified the facility with which the principles of preventive medicine could be applied. He was satisfied that it was possible to reduce the incidence of sickness among the miners of New South Wales. In the course of their investigation they had been able to determine the amount of sickness at Broken Hill. Among seven thousand men employed, four hundred had been permanently injured as a result of occupation. It would seem that by applying measures similar to those adopted in South Africa, the rate of sickness would be similarly diminished. It had been found that by paying attention to the conditions obtaining in the various operations of mining the amount of dust could be reduced to one-tenth or to even one-twentieth of that previously present. They discovered a most interesting and important fact in regard to lead. Every person employed in Broken Hill for a given period was found to be absorbing lead. They had recovered the metal from the bodies of men who had died from all causes in Broken Hill during the period covered by their investigation. It would appear that the employers had been aware of the danger incurred in regard to lead poisoning. They had collected evidence to show that the amount of lead poisoning had been materially reduced since the year 1907. A very thorough medical examination had revealed the fact that, while 66% of the men who had worked at Broken Hill for over twenty years, would be passed by any insurance company as "first-class lives," every one of these men had been absorbing lead during the whole period of his employment.

Apart from the investigations concerned with the special risks or hazards associated with a miner's employment, they had turned their attention to the question of ordinary risks. Professor Chapman was satisfied that these ordinary risks varied to some extent with the occupation. They had accumulated a large amount of data concerning illness unassociated with the special risks of a miner's occupation. It had been extremely difficult to obtain information concerning the incidence of chronic nephritis among persons employed in the various occupations in Australia. Until morbidity figures for each occupation were available, it would not be possible to ascertain whether chronic nephritis was more or less prevalent among the workers of Broken Hill. He welcomed the suggestion made by Dr. Lanza that information should be collected from the records in the large metropolitan hospitals. There was no doubt as to the urgent necessity for a careful investigation into the amount and nature of sickness in the different

occupations. He thought that the medical profession as a whole should pay special attention to these problems.

He was glad to hear from Dr. Lanza that the development of his scheme would embrace the special training of medical practitioners in industrial hygiene. With practitioners trained in this way there would doubtless be a great reduction in the amount of sickness. In the past the control of factories in regard to ventilation, lighting and sanitation had been in the hands of a medical officer of health, but the actual work of inspection had been carried out by inexperienced persons. They had had evidence of this at Broken Hill. Investigations into these matters had been carried out by engineers and mine inspectors who had little or no conception of the medical aspects of the problem. In conclusion, Professor Chapman expressed his agreement with Dr. Lanza that industrial hygiene was essentially a medical subject.

Dr. G. H. TAYLOR expressed his thanks to the Council of the Branch for having invited him to attend the meeting and to take part in the discussion. As medical officer of the New South Wales Government Railways and Tramways, he had had opportunities for studying many of the problems of industrial hygiene among a very large number of workers. There were in the workshops of the Department approximately six thousand men engaged, while the total number of employees was approximately fifty-one thousand. There was in the New South Wales railways a large section of men working under what might be regarded as unfavourable industrial conditions. Although the medical officers were engaged for the greater part of their time within their offices, they had been able to collect information confirming much of what Dr. Lanza had said regarding special hazards and ordinary risks. Many rules and regulations had been introduced to safeguard the men from accidents and disease. These measures naturally were limited by the extent of their knowledge and of their experience. Dr. Taylor referred to the "safety first" system, which entailed the reporting of every discovered defect to the superintendent. They had recently engaged a sanitary expert to carry out investigations and, as a result, many defects had been revealed. He was satisfied that the departments had highly trained and competent men in every branch. He thought that the workshops should be under closer medical supervision than they were at present. Under the existing circumstances, however, it seemed to him that it would be impracticable to carry into effect many of the measures indicated by Dr. Lanza.

One of the difficulties in connexion with the employment of a large number of persons in a service like that of the railways was that of dealing with men who, as a result of age or disease, were no longer able to carry out their duties. Many of the employees reached the stage when they were no longer capable of earning a living. He thought that methods were required for the protection of these men.

Dr. W. G. ARMSTRONG stated that it was with much pleasure and interest that he had listened to Dr. Lanza. This was not only due to the subject of his discourse, but also to the position occupied by Dr. Lanza as advisory expert in industrial hygiene in the Department of Health of the Commonwealth and as a delegate of the International Health Board.

He stated that industrial hygiene was a relatively new branch of one of the youngest of the medical sciences—public health. As Dr. Lanza had pointed out, it was to Great Britain that the world owed the greater part of the pioneer work in this field. The reason was that Great Britain was the first country to be industrialized and she had been forced to meet the new and strange set of conditions which had grown up with the industrial revolution. To illustrate the newness of the science of industrial hygiene, Dr. Armstrong referred to the rapid change which had taken place in their attitude toward the very important question of the dust problem in particular relationship to tuberculosis. Ten years ago it had been taught that the inhalation of dust of all kinds was associated with the occurrence of pulmonary fibrosis, which paved the way for the development of pulmonary tuberculosis. Investigations, particularly in coal mining and cement grinding industries, had disclosed that some dusts were not responsible for an undue incidence of pulmonary tuberculosis. The theory had been put forward that dust consisting of

particles with sharp angles was the offender. Later the fact had emerged that only one kind of dust was found in association with this condition, namely, free silica. Silicates were harmless. Silica appeared to have a specific effect in sensitizing the lungs to tuberculosis infection. He referred to the sad experience of its baneful effects among sewer miners or rock choppers in the Sydney sandstone.

In a new country like Australia they were not bound as much by vested interests and by the bad conditions of overcrowding and insanitary housing as in a country like Great Britain. He thought that in consequence much more might be expected from the propaganda of industrial hygiene. They would, however, be faced with the difficulty of overcoming the veiled hostility of many employers and employees. Unless there was some cooperation on both sides, progress was likely to be slow. The problems which industrial hygienists would have to solve in Australia, were many and intricate. There were those connected with the mining industries. At Broken Hill this matter had already been tackled. The sanitation of coal mines, especially in regard to the prevention of hookworm, required attention. He suggested that the suitable housing of miners would come within the purview of industrial hygiene. Then there were the problems concerned with industrial fatigue and with the effects of environment on efficiency and safety. These effects embraced temperature, ventilation, lighting and humidity. All these matters would have to be studied by Australian observers under Australian conditions.

Dr. Armstrong said that another avenue for the energies of the industrial hygienist lay in the organization of industrial welfare schemes in connexion with large business undertakings and perhaps with smaller ones in combination. At some of the larger Sydney business firms schemes of this kind under trained welfare workers were already in operation. These schemes had to be popularized and extended. The first step would consist in allaying the animosity and the suspicion of the industrialists. If this could be done, everything would follow.

Dr. RALPH WORRALL congratulated Dr. Lanza on his skilful survey of a completely new subject. He was particularly pleased that emphasis had been laid on the desire to interest the practising members of the medical profession in the work rather than to create a large army of non-professional specialists. It would not be possible to institute a general scheme of examination and medical control of all persons employed in large industrial undertakings as a compulsory measure, although it would be possible to carry it into effect by enlisting the sympathy of the employers. In connexion with the compilation of statistics from the hospital records, he asked who was to undertake this gigantic task. At the Sydney Hospital there was a wealth of information, but it existed in a form which was useless for Dr. Lanza's purpose. It was the duty of the Government to institute a department whose function would be to ascertain from hospital records and from other sources the incidence of disease among those employed in industries and other occupations. Dr. Worrall was convinced of the advisability of extending such an inquiry to the smaller establishments. He referred to an incident to exemplify the value of the introduction of common sense rules of hygiene into the lives of workers. An industrial psychologist was visiting a factory of small articles and noticed that some girls were engaged in carrying out one small process in the manufacture. These girls sat at their work all day long. A porter was engaged to carry the article to the girls and to return them to another part of the factory when the small tasks were completed. These girls all complained of a variety of symptoms. The psychologist suggested that the porter should be dismissed and that the girls themselves should be required to carry the small bundles from time to time to another part of the factory. The effect of this interruption of the monotonous sedentary work and of the introduction of a certain amount of physical exercise was very striking. In conclusion, Dr. Worrall maintained that the employment of young girls and married women in factories and other industrial establishments was deleterious to their health and damaging to the community.

Dr. E. S. STOKES stated that he had been very interested

In Dr. Lanza's address. If any doubt had existed in the mind of those present concerning the value of an organized scheme on industrial hygiene, Dr. Lanza could rest assured that he had removed that doubt. He, the speaker, had been associated for a considerable time with a large industrial undertaking, the Metropolitan Board of Water Supply and Sewerage. The number of persons employed by the Board was approximately 2,500. Of these, 2,000 worked in the open and 500 worked indoors. During the past twelve months approximately 1,000 men had been away for two or more days on account of sickness. The average length of time worked out at ten days. In addition, 220 men had been absent on account of accident for an average period of ten days. Dr. Stokes had found that very little of this absence had been due to the occupational conditions of the men. There had been one or two men whose illness might have been caused or influenced by sandstone dust, while one or two others were supposed to have had a skin condition spoken of as cement itch. He was satisfied that the men working in the sewers and at the outfall works were not exposed to any heavy special hazard. It had been held in the past that enteric fever and sewage were intimately associated. Many of their men had been in contact with sewage for a long period, but they had not had a single typhoid infection in twenty years. One of the workers living in a very isolated position on the farm had had an attack of enteric fever, but inquiries elicited the fact that the infection had been carried by a visitor from a neighbouring suburb.

Dr. Stokes referred to the evidence he had given some years previously before an arbitration board. The sewerage workers had made a claim for increased emoluments on account of the deadly nature of their occupation and had called many witnesses to testify to the dangers. Dr. Stokes, in giving his evidence, had produced statistics of the morbidity rates during a period of five years. He had been able to prove that of all the branches of work in this department, that of the sewer workers was undoubtedly the healthiest. His evidence had astounded the Board and the solicitor for the claimants had declined to proceed with a cross-examination.

Dr. R. DICK called attention to the fact that the majority of those present were members of the larger army of curative physicians. He anticipated that it would be a long time before the conditions would be reversed and the larger army composed of specialists in industrial hygiene. He thought that the public health authorities would always have to rely on the general practitioner to assist them in the more important work of controlling disease. He had had experience for many years of a large industrial centre, the coal mining district near Newcastle. He had endeavoured to find out something about the morbidity statistics of the various occupations in Australia. It appeared, however, that there was no reliable information available. He was scarcely surprised that elaborate statistics had not been compiled in any part of Australia, in view of the relatively small number of men employed in any one industry. He believed that the Newcastle mine field represented the largest industrial undertaking south of the line. There were eleven thousand men employed. He recognized, however, that this number was quite insufficient to serve as a statistical basis.

Dr. Dick expressed the opinion that the question of the industrial physician was likely to prove a very important one in the near future. Industries were stated to have become paralysed during the past few years by high wages. Employers asserted that workmen absented themselves for trifling causes. The majority of the employers would probably approve of the employment of a doctor to examine the worker and to detect unsuspected ill-health. On the other hand, the employees would probably object to a routine examination, on the ground that it was a device of the employers to tighten their control. If an attempt were made to render the examination of workers compulsory, there would be an outcry which might be very serious. There was no examination of coal miners. Experience showed that in purely coal mining settlements in the Hunter River district the general death rate was 2% to 3% less than that for the district generally and for the State. He admitted that the conditions of employment and housing could be improved. The arrangements for housing

miners in some places were entirely in the hands of the owners. This was not always satisfactory. The provision of change and bath houses at mines had been urged in various places, but reports showed that only a small proportion of employees used them where they had been installed.

Professor Chapman had mentioned that a large number of men at Broken Hill were absorbing lead, but that they manifested no symptoms of lead poisoning. At the smelting works at Cockle Creek, where Broken Hill ores were treated, Dr. Dick had examined all the men employed about fifteen years previously. Nearly all the men taking part in the smelting operations had shown a blue line on their gums, but very few of them had suffered from the effects of lead poisoning. He suggested that the sulphur in the air led to a rapid deposition of lead sulphide in the gums. The excretion of the lead took place at a rate sufficient to prevent its accumulation in the tissues, so that no other clinical signs or symptoms were encountered.

He agreed that welfare work among industrial undertakings was very important, but it should be under the direct supervision of competent people. Recently in one large establishment where 1,500 people were employed the casualty room was placed under the charge of an employee whose ordinary work was that of cleaning guts. This man was called away from his work to the casualty room to dress wounds. Dr. Dick was convinced that the employees valued the existence of casualty rooms, ambulance transport and hospital facilities and were easily organized to support these important utilities. In the Newcastle district a free ambulance service was in existence. This was largely supported by the workers, who contributed a penny a week. In many cases the employers subsidized the contributions of their employees. In eleven months the sum of £4,000 had been collected for this free ambulance service. In addition, the men paid three pence a week toward the support of the district hospitals and a number of the employers subsidized this by a similar amount.

Dr. HARVEY SUTTON, O.B.E., said that after the champagne of Dr. Lanza's address he felt that his remarks would appear like small beer. He referred to the tendency in Australia to-day of a movement of the population toward the urban areas. The country people were flocking to the city and the rural population was not keeping up with the natural increase. Greater Sydney contained nearly one-half of the total population of the State. This movement city-wards went hand in hand with a general industrialization. Professor Griffith Taylor had prophesied that the coal-bearing areas would eventually attract the greatest number of people in Australia, as they had done elsewhere. Dr. Sutton regarded this problem as one of permanent as well as of immediate and vital concern to the community. It was difficult to obtain reliable morbidity and mortality statistics in relation to occupation. A few facts had been elicited from school work. It was known that organic heart disease and rheumatism were associated with the occupation of general labourer, whereas thyreoid enlargement appeared to be independent of any particular occupation. Severe degrees of rickets were discovered in persons living in houses with less than four rooms. At times the incidence of disease appeared to be influenced by occupation, together with local conditions. He instanced tuberculosis in school children as an example. Low wages and bad housing conditions were associated with malnutrition. They had found that the height and weight of children living in the industrial areas were less than those of children in the residential areas. Dr. Jean Greig had examined one thousand women teachers in Victoria who had applied for one month's leave of absence. The most common conditions found among these teachers were anæmia, neurasthenia, mental depression of varying degrees, even amounting to insanity, and tuberculosis. There was also a high incidence of involvement of the thyreoid gland. It would thus appear that the occupation of teaching threw a strain on the blood-forming and nervous systems. These teachers did not make use of recreative activity to a sufficient extent and many in rural schools were badly fed.

Dr. Sutton called attention to an anomaly in Australian university life. The responsible authorities kept no check on the health conditions of students. They were indifferent

to the effect of academic work on young persons in the most susceptible years of life. He also drew attention to the fact that the medical profession had not yet set its own house in order. It was not known what the mortality or morbidity of the medical profession was. Osler had called attention to the frequency of *angina pectoris* among medical men. Tuberculosis had a high incidence in the professional class. He thought that the university medical schools should appoint committees to investigate the morbidity and mortality among their own graduates. Information could be imparted confidentially. It would form a very valuable lesson in occupational hygiene.

In the next place, he referred to the question of cleanliness in industries. The significance of cleanliness had been illustrated in a most remarkable manner during the war at some of the munition factories. The trinitro-toluene factories under the Navy had been well planned and carefully supervised and the incidence of poisoning had been low. Similar factories instituted and controlled by the War Office had lacked the cleanliness and good order of the naval establishments and in them the incidence of trinitro-toluene poisoning was high. In speaking of the industrialization of women, Dr. Sutton pointed out that the loss of sixty thousand of their best lives and the damage to a much larger number of young and healthy men had compelled a greater employment of women in industries. Dr. Sutton was convinced that in the future science would supply the solution of social unrest. The grumblers were the dyspeptics, while the euphetics were the optimists. The owners of industrial undertakings would soon realize that commercial prosperity depended on the temper and consequently on the health of the worker. It had been shown that the decrease in the mortality of pulmonary tuberculosis ran parallel with the actual value of wages and with the nature and quality of food. In speaking of the question of dietary, Dr. Sutton referred to the statistics produced by the Board of Trade of New South Wales concerning meat consumption. Mr. D. T. Sawkins had shown that the amount of meat consumed per individual in Australia had diminished greatly and was now less than that consumed per individual in England before the war. Collis had pointed out that there was a parallelism between the mortality rate in a section of industrial workers and the percentage of men in the same industry voting in favour of a strike. Consciously or unconsciously the deaths and invalidity of fellow workers affected their attitude toward their employers. Dr. Sutton thought that a scientific investigation based on the examination of male individuals at six and twelve during school life and at eighteen and twenty during the term of compulsory service would reveal much very useful information. England was progressing in this direction while they were forgetting the motto: "Advance Australia!"

Dr. T. L. O'REILLY said that modern industrial hygiene was in its infancy in New South Wales. In the Railway Department they had a foundation upon which a superstructure of hygiene could be built. The medical branch had been in existence for thirty-four years. Dr. O'Reilly gave a short *résumé* of the work of this branch. Every applicant for employment was examined. While examination was not as complete as a life insurance examination, it had been sufficient in 1921 to reject 446 applicants out of a total of 8,016 on account of physical defects. Eye-sight was also tested. The standards were uniform for Australia and had been adopted on the recommendations of a conference of railway medical officers of all the States which was held in Melbourne in 1921. During the year 730 applicants failed to reach the eye-sight standard for the position sought. All men whose work was connected with the running of trains or trams, were subjected to tests of colour sense. During the year 263 men failed in this test. Apart from the examination of applicants a general medical supervision on all employees of the Commissioners was conducted. The vision and colour sense of all men connected with the running lines were tested by a medical officer every four years. Engine-drivers were tested every two years. The number of employees tested in this way in 1921 was 6,931. The regulations also provided for the examination of the eye-sight of men on promotion for certain positions and after serious illness or injury. All employees off duty resident in the metropolitan district were seen by the medical officer as soon as they were able to

travel and from time to time until they were able to resume work. Employees resident outside the metropolitan district were required to furnish medical certificates. These medical certificates were reviewed by the medical officer and when it seemed necessary, the employee was required to attend at headquarters for examination. In the case of employees off duty on account of illness, medical certificates were required when the absence exceeded three days and medical attendance was required when the absence exceeded fourteen days in the case of residents in the metropolitan area. No payments were made as sickness or accident compensation for illness or accident until a certificate from the medical officer was produced.

A further provision for the safety of the travelling public took the form of a monthly report from the medical officer concerning the health of every engine-driver in the service. The superior officer of each driver was required to write the word "doubtful" after the name of any driver whose health did not appear to be satisfactory.

The examination of men in connexion with application for change of duty, claims for compensation, etc., were also undertaken by the railway medical officer. All the examinations were necessary to protect the life and limb of the travelling public and also to protect its pocket. All employees with six months' service, save those employed on construction, deviation and duplication works and in the railway refreshment rooms, were required to contribute 1.5% of their wages or salaries to the superannuation fund. The balance of this fund was a charge on the public. Dr. O'Reilly claimed that the medical examination helped to lessen the taxpayer's contribution. The medical examination also protected the employee or would-be employee from injury or disaster due to defective vision or colour sense or physical disability. The Railway Commissioners were further protected in their obligation to pay full wages to employees injured in the course of their work under the *Railway Amendment Act, 1916*, and to pay compensation under the *Workmen's Compensation Act, 1916*.

The Railway and Tramway Ambulance Corps was an organization based on the principles of preventive medicine and industrial hygiene. The Corps had 11,948 members. Thus one employee out of every ten was qualified to render first-aid. There were 899 first-aid chests and boxes and 717 stretchers distributed throughout the service. At the Eveleigh Workshops three first-aid rooms and at the Clyde Workshops one first-aid room had been established for the benefit of the workmen. At these four stations no less than 3,236 injured persons had received attendance during the month of June. In the smaller shops voluntary first-aid was rendered by trained men. A qualified sanitary inspector was attached to the Medical Branch, whose duties included the inspection of sanitary arrangements. In conclusion, Dr. O'Reilly gave a brief survey of the "safety first" system of the Railway and Tramway Department.

Dr. J. S. PURDY, D.S.O., congratulated Dr. Lanza not only on his admirable address, but on having chosen as his special province such a fascinating branch of preventive medicine as industrial hygiene and on being associated with the Rockefeller Institute in connexion therewith.

On the introduction of the *Factory Act* into Tasmania as the first Chief Inspector of Factories it had been his duty to draft the regulations. He had found that there was no uniformity in regard to the control of factories in the six States, although the general regulations had been copied wisely from those of the Home Office in England. In one regard at least New South Wales had adopted special standards as regards humidity in factories, based on the original work of the late Mr. John L. Bruce, which had attracted the interest of Haldane, Leonard Hill and other workers on this subject.

With regard to the attitude of employees towards industrial hygiene, he had found their concern was more to secure shorter hours and increased wages and they evinced little interest in the hygienic conditions of their work. Unfortunately, it was still true that any effort to improve these conditions was too frequently viewed as unwarranted interference with their vested rights to inevitable disease and death. The findings of the Health of Munition Workers Committee had demonstrated how great a factor in indus-

try fatigue was and the relationship of hours of labour to the amount of sickness, the accident rate and the output.

Dr. F. A. MAGUIRE, D.S.O., referred to the information gained in the gynecological wards and Out-Patient Department at the Royal Prince Alfred Hospital. A large proportion of the patients were women employed in industry. Many were factory hands, including assistants, machinists, pressers and so forth. Waitresses were also numbered among the patients. The single girls were between fourteen years and thirty years of age. The majority of the complaints were on account of minor ailments, such as amenorrhœa, dysmenorrhœa, backache, digestive disturbances. In addition, some of the women needed treatment for disturbances of pregnancy and for venereal disease. He was satisfied that uncontrolled industrial employment of women contributed to the loss of infant life. The cause of much of the minor illness was not the length of the hours of labour, nor the amount of standing. The most important factor was the lack of exercise; the girls and women spent their working lives sitting, without a chance of taking exercise. In the second place, the absence of a hot mid-day meal was productive of harm. The third factor was the neglect of personal hygiene. These women were irregular in regard to their evacuations and paid little heed to irregularities of menstruation. In the last place, many stayed out late at night, visiting the picture shows, and missed valuable hours of sleep. The summation of small stimuli resulted in loss of health. Dr. Maguire was convinced that medical supervision was needed to remove these minor disabilities. Their removal would be reflected in a gain in efficiency. He likened the industrial army of to-day to the military armies of a century ago, when there was a lack of organization. The modern army depended on the regimental medical officer to keep up the standard of health. Similarly, the industrial organization must look to the general practitioner for the maintenance of a high standard of health.

Dr. G. GORDON CRAIG thought that there was a bright future in industrial hygiene, because the employer was beginning to realize that it paid to supervise the health of the workers. Medical inspection meant a reduced wastage. He had no doubt that Dr. Lanza and his colleagues would obtain the sympathy of the employers. The sympathy of the medical profession was also assured. Dr. Craig spoke of his experience in the past among leather workers. He had learned that there was an undeniable association between pulmonary tuberculosis and the trade of bootmaker.

Dr. T. H. FIASCHI, D.S.O., pointed out that Dr. Lanza, in prefacing his remarks, had thanked the Branch for having invited him to address the meeting. He wished to reciprocate and to thank Dr. Lanza for his most excellent paper. He spoke both as a medical man and as a citizen.

In his reply, Dr. LANZA said that he had listened to the discussion with much pleasure and profit. He would only attempt to deal with two points. In regard to the collection of morbidity statistics, they had secured the collaboration of the Federal and State statisticians. These gentlemen had undertaken to secure all the available figures and to have them properly interpreted. He thought that Dr. Dick was a little pessimistic. The numbers quoted by him were sufficiently large to enable them to learn a great deal about occupational morbidity and mortality. He pointed out that the vital statistics of Australia were recognized throughout the world as the best compiled records.

In the next place, he admitted that the labouring man looked on the industrial hygiene movement with suspicion. He regarded it as an efficiency scheme. While they knew that such a view was preposterous, it might be difficult to persuade the worker. It would be impossible to recruit industry by excluding the inefficient. Industrial hygiene aimed at a conservation of energy. Employers need not refuse anyone who was able to perform some task, unless that man was suffering in such a manner as to be a menace to his comrades. Cripples could be used in industry, provided that there was medical supervision. It had been shown that under favourable conditions deaf-mutes worked as well as normal people. It was unnecessary to eliminate the unfit. What was required was to enable the physically defective man to stay in the game. Some suitable form of work could be found for all.

NOTICES.

THE COUNCIL OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION has arranged the following provisional programme of the Branch meetings. The Scientific Committee reserves to itself the right to modify the arrangements, but it is hoped that no changes will be necessary.

September 6, 1922.

CLINICAL MEETING at St. Vincent's Hospital, Melbourne, at 8.15 p.m..

October 4, 1922.

At the Walter and Eliza Hall Institute of Research in Pathology and Medicine, Melbourne Hospital, at 8.15 p.m.

Dr. H. DOUGLAS STEPHENS: "Clinical Symptoms of Enlargement of the Spleen in Children."

Dr. S. O. COWEN: "Familial Splenomegaly."

Dr. K. HILLER will open the discussion.

November 1, 1922.

CLINICAL MEETING at the Children's Hospital, Carlton, at 8.15 p.m..

NOMINATIONS AND ELECTIONS.

THE undermentioned has been nominated for election as a member of the New South Wales Branch of the British Medical Association:

CLOUSTON, KATHLEEN, M.B., Mast. Surg., 1921 (Univ. Sydney), Taralga.

THE undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

BERTRAM, MARY NICHOLL, M.B., Ch.M., 1922 (Univ. Sydney), Trundle.

DUNLOP, ALBERT TANGE, M.B., Mast. Surg., 1913 (Univ. Sydney), 185, Macquarie Street, Sydney.

FLYNN, JAMES ALOYSIUS FOEDUS, M.B., Ch.M., 1922 (Univ. Sydney), Sydney Hospital.

WILSON, KENNETH JOSEPH GILMORE, M.B., Ch.M., 1922 (Univ. Sydney), Mental Hospital, Gladesville.

THE undermentioned has been elected as a member of the Victorian Branch of the British Medical Association:

ELLIS, CARLTON ATKINSON, L.R.C.P. (Lond.), M.R.C.S. (Eng.), 1907, F.R.C.S. (Edin.), 1909, Brighton Beach.

Special Correspondence.

LONDON LETTER.

BY OUR SPECIAL CORRESPONDENT.

The "Harley Street Crisis."

A SURPRISINGLY large amount of interest has been shown in the lay press with regard to the so-called "Harley Street crisis"; the consulting rooms of Harley Street and the adjacent thoroughfares have been described as almost empty and the doctors inhabiting them have recently become reduced, we have been told, to a state of comparative indigence. Only by a reduction of the fees charged (so the story goes) can the lost patients be induced to return to the deserted doorsteps. It is, I think, worth while to inquire into the amount of truth contained in

these statements. If one takes the amount of work done by all the medical men in Harley Street during the past two years and divides it by the total number of those medical men, the quotient is no doubt considerably less than that of preceding years, even in spite of the increased fees now charged. The explanation is twofold. In the first place, the middle and upper classes are poorer than they were, trade is universally bad and income tax has been taking £30 of each £100 of unearned income and of each £100 by which earned income may have increased. Specialists may therefore expect a diminished income, in just the same way as the panel doctor's capitation fee has been cut down or as the lawyer's clients now deny themselves, whenever possible, the luxury of litigation. In the second place, it must be borne in mind that, after the war a number of medical men found themselves discharged from military service with a considerable amount of capital, a certain degree of special experience (notably in surgery) and a disinclination to adopt the vocation of general practitioner, in which, but for the war, they would have settled down without complaint. These men took rooms in the Harley Street neighbourhood (incidentally forcing up the local rents) and, since they lacked the backing of a hospital appointment, are now more than the genuine specialist, feeling the pinch of bad times. Two other reasons may be adduced which, while contributing to the "crisis" are independent of post-war influences. During the past two generations surgical and other specialism in the provinces has steadily increased and admirable nursing homes have been there provided, so that now it is comparatively rare for the London specialist to be summoned far afield either for operation or consultation. Lastly, there is a tendency for the patient of the present day to show himself less than formerly hypnotized by the magic word "specialist."

General Practitioner and Specialist.

The average ability, equipment and resource of the general practitioner, especially perhaps in rural and semi-rural districts, has steadily increased, quite independently of the special experience gained by some during the war. The fee charged as a rule in the Harley Street area for a first consultation is three guineas, for a second two—sums which have been increased above those charged before the war. These are fees which in these hard times the lately rich and newly poor may find difficulty in paying. They have two remedies and have to a considerable extent availed themselves of the first, namely, the less ready recourse to the specialist and the more extended employment of the general practitioner. If, however, a specialist's opinion is necessary according to the judgement of the attendant doctor (and against his judgement it is almost always unnecessary) or even if it be advisable on no other grounds than to confirm the diagnosis or inspire the confidence of the patient, then there has been and still is no difficulty in inducing the specialist on the recommendation of the practitioner to reduce his customary fee by one-third or two-thirds. The patient who is not sent by his doctor and who demands "Harley Street" in preference to other treatment, is not justified in complaining if he has to pay the customary fee.

For the services of the genuine consultant having hospital experience, gained by much exacting and voluntary work, three guineas is not an excessive fee. To maintain a home in Harley Street costs several thousands *per annum* and to rent a room there from five to ten pounds per week. A more genuine and significant social grievance is the very definite lack of provision for surgical operations and nursing, except either in voluntary hospitals or in usually extremely expensive and not always very efficient private nursing homes. In certain towns one or other of the nursing hospitals has "wards" in which the patient pays smaller nursing fees than usual and certain London hospitals have a small number of beds set apart for "paying patients."

In one provincial city there is a non-charitable hospital of one hundred beds, founded in 1914 for paying patients. Each of the twenty specialist members of the staff, all of whom are members of the honorary staff of a general or special hospital, is entitled to call on any of his colleagues for aid in diagnosis and treatment and the patient thus receives "team" treatment, *e.g.*, medical, sur-

gical, bacteriological and X-ray, for an inclusive charge, which is sometimes less than that made for nursing alone in a private home. Further provision of this nature is undoubtedly required in this country.

Obituary.

EDWARD KEN HERRING.

THE news of the death of Edward Ken Herring, which took place on June 27, 1922, was received with wide-spread regret by a very large number of his colleagues in New South Wales and Victoria.

Edward Ken Herring, who was the second son of the late Archdeacon Herring, of Beechworth, Victoria, was born at the Hutt River, New Zealand, in 1864. He was educated at the Melbourne Grammar School. A few years after leaving school he went to England and entered the medical school at the Middlesex Hospital. In 1896 he obtained the diplomas of the conjoint colleges. He then returned to Australia and served for two years as Resident Medical Officer at the Ballarat Hospital. About the middle of 1898 he entered private practice at Shepparton, Victoria. He soon established for himself the reputation of a careful, skilful and sympathetic practitioner. In April, 1907, he left Shepparton and established himself in West Maitland, New South Wales. After a short time he was appointed an honorary medical officer to the West Maitland Hospital and in the meantime he worked up a very valuable practice. His ability as a general practitioner, combined with his admirable personal qualities, endeared him to his many patients and to all his colleagues in the district. He took an active part in the work of organizing the profession and was prominent among the members of the New South Wales Branch of the British Medical Association. He worked strenuously and well for the Central Northern Medical Association, a body affiliated with the New South Wales Branch. The confidence imposed in him by his colleagues is reflected in the fact that he was elected during the course of several years to positions on the executive of the local association and for two years he served as its President. He was well known in Sydney for his wise counsels and his practical common sense, which were admirably displayed at the Annual Meetings of the Delegates of the Affiliated Local Associations with the Council of the New South Wales Branch.

He took a keen interest in many movements and activities and was particularly interested in the Agricultural and Horticultural Society, on whose committee he served for several years. He was a church warden at St. Mary's Church of England, West Maitland. At the end of 1920 he retired from practice and during the past eighteen months, he, together with his wife and family, lived at Double Bay, Sydney. Much sympathy is felt with Mrs. Herring and his four sons.

GEORGE JOHNSTONE CAMPBELL.

It is with much regret that we have to record the death of George Johnstone Campbell, who died recently as the result of an abdominal injury.

George Johnstone Campbell was born at Beith, Scotland, in 1876. He studied medicine at Edinburgh and obtained the diplomas of Licentiate of the Royal College of Surgeons and the Royal College of Physicians of Edinburgh and of the Faculty of Physicians and Surgeons of Glasgow in the year 1900. For several years he practised his profession in the old country.

He arrived in Australia in January, 1913, and practised both at Busselton and at Claremont, Western Australia. He was a successful practitioner and was universally respected by all with whom he came into contact. He held the position of medical officer to the Old Men's Home at Claremont, at which institution he rendered admirable service. He was a member for many years of the Western Australian Branch of the British Medical Association and enjoyed the esteem of his colleagues. He retired from practice about a year ago on account of ill-health. He is survived by a widow and three sons.

Correspondence.

THE VENEREAL DISEASES CLINIC AND DERMATOLOGICAL DEPARTMENTS.

SIR: In your footnote to my letter published in THE MEDICAL JOURNAL OF AUSTRALIA of August 5, 1922, page 172, you have assumed "That the Board of Directors of the Royal Prince Alfred Hospital have not considered it expedient to divorce the Venereal Diseases Clinic for syphilis from the Dermatological Department." While I admit that two of the medical officers treating patients for syphilis have held positions as physicians for diseases of the skin in the hospital, I claim that there is no administrative connexion between the two departments, the Venereal Diseases Clinic and the Dermatological Department.

Yours, etc.,

A. J. COLLINS,
Medical Superintendent.

Royal Prince Alfred Hospital,
Camperdown, Sydney,
August 18, 1922.

Books Received.

COURAGE, by J. M. Barrie; 1922. London: Hodder & Stoughton, Limited; Sydney: Angus & Robertson, Limited; Post 8vo., pp. 47. Price: 2s. 6d. net.

MODERN CHEMICAL LECTURE DIAGRAMS, by Dr. Geoffrey Martin, D.Sc. (London and Bristol), Ph.D., F.I.C., F.C.S., assisted by J. M. Dickson, B.Sc., and Major J. W. Christelow (late R.E.), B.Sc., A.I.C.; 1922. London: Sampson Low, Marston & Company, Limited; Crown 8vo., pp. 88, with 36 lecture diagrams. Price: 3s. 6d. net.

PHARMACOPŒIA OF THE ROYAL PRINCE ALFRED HOSPITAL; 1922. Sydney: Angus & Robertson, Limited; Pocket Size; pp. 63, interleaved. Price: 3s. net.

THE PRINCIPLES OF PHYSICS AND BIOLOGY OF RADIATION THERAPY, by Dr. Bernhard Kroenig and Dr. Walter Friedrich, of the University of Freiburg im Breisgau, with an appendix by Dr. Henry Schmitz, Chicago; 1922. London: William Heinemann (Medical Books), Limited; Demy 4to., pp. 271, with 36 figures in the text and 20 coloured and 11 black and white plates and 32 tables. Price: 42s. net.

THE THOMAS VICARY LECTURE: A GLIMPSE INTO THE HISTORY OF THE SURGERY OF THE BRAIN: DELIVERED BEFORE THE ROYAL COLLEGE OF SURGEONS OF ENGLAND ON DECEMBER 8, 1921, by Sir Charles A. Ballance, K.C.M.G., C.B., M.V.O., M.S. (Lond.); 1922. London: Macmillan & Company, Limited; Demy 8vo., pp. 110, with 30 illustrations. Price: 10s. 6d. net.

THE WYNDHAM POWELL AERO-URETHROSCOPE (1922 MODEL): FOR EXAMINATION AND OPERATION BY A NEW DEVICE, by W. Wyndham Powell, F.R.C.S.; 1922. London: John Bale, Sons & Danielsson, Limited; Demy 8vo., paper cover, pp. 22, with two illustrations. Price: 2s. 6d. net.

Medical Appointments.

DR. P. F. L. HUSSEY has been appointed by the Commonwealth Government as Quarantine Officer for the ports of Streaky Bay and Cape Trevenard, South Australia.

DR. JOSEPH L. SHELLSHEAR, who graduated at the University of Sydney in 1907, has been appointed Professor of Anatomy at the Victoria University, Hong Kong.

THE announcement has been published in the *New South Wales Government Gazette* of August 4, 1922, that DR. R. T. PATON (B.M.A.) has resigned his appointment of Commissioner under the *Venereal Diseases Act, 1918*, and that the last day of his service was June 30, 1922.

DR. R. E. HARRIS (B.M.A.) has been appointed a Junior Medical Officer in the Lunacy Department, Victoria.

DR. N. L. CASS (B.M.A.) has been appointed District Medical Officer and Public Vaccinator at Norseman, Western Australia.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429, Strand, London, W.C.

| BRANCH. | APPOINTMENTS. |
|--|---|
| NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney | Australian Natives' Association Ashfield and District Friendly Societies' Dispensary Balmmain United Friendly Societies' Dispensary Friendly Societies Lodges at Casino Leichhardt and Petersham Dispensary Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney Marrickville United Friendly Societies' Dispensary North Sydney United Friendly Societies People's Prudential Benefit Society Phoenix Mutual Provident Society |
| VICTORIA: Honorary Secretary, Medical Society Hall, East Melbourne | All Institutes or Medical Dispensaries Australian Prudential Association Proprietary, Limited Manchester Unity Independent Order of Oddfellows Mutual National Provident Club National Provident Association |
| QUEENSLAND: Honorary Secretary, B. M. A. Building, Adelaide Street, Brisbane | Brisbane United Friendly Society Institute Hamden District Hospital, Kurildala, North Queensland Stannary Hills Hospital |
| SOUTH AUSTRALIA: Honorary Secretary, 12, North Terrace, Adelaide | Contract Practice Appointments at Renmark Contract Practice Appointments in South Australia |
| WESTERN AUSTRALIA: Honorary Secretary, 3 Saint George's Terrace, Perth | All Contract Practice Appointments in Western Australia |
| NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington | Friendly Society Lodges, Wellington, New Zealand |

Diary for the Month.

- AUG. 30.—Victorian Branch, B.M.A.: Council.
AUG. 31.—South Australian Branch, B.M.A.: Branch.
SEPT. 1.—Queensland Branch, B.M.A.: Branch.
SEPT. 6.—Victorian Branch, B.M.A.: Branch.
SEPT. 7.—New South Wales Branch, B.M.A.: Nomination of Candidates for Federal Committee.
SEPT. 8.—New South Wales Branch, B.M.A.: Clinical Meeting.
SEPT. 8.—Queensland Branch, B.M.A.: Council.
SEPT. 8.—South Australian Branch, B.M.A.: Council.
SEPT. 9.—Eastern District Medical Association, New South Wales.
SEPT. 12.—New South Wales Branch, B.M.A.: Ethics Committee.
SEPT. 13.—Western Australian Branch, B.M.A.: Council.
SEPT. 13.—Melbourne Pædiatric Society.
SEPT. 14.—Victorian Branch, B.M.A.: Council Meeting.
SEPT. 15.—Central Southern Medical Association (Goulburn), New South Wales.
SEPT. 15.—Eastern Suburbs Medical Association, New South Wales.
SEPT. 19.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

Editorial Notices.

MANUSCRIPTS forwarded the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, B.M.A. Building, 30-34, Elizabeth Street, Sydney. (Telephone: B. 4635.)

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